DOCUMENT RESUME

ED 252 229 IR 050 969

AUTHOR	Moeller, T.; Mushonga, B. L. B.
TITLE	Use of Information and Documentation for Planning and Decision-Making. Summary Report and Proceedings of Joint ESAMI/PADIS/DSE Seminar (Salisbury, Zimbabwe, August 3-7, 1981).
INSTITUTION	Zimbabwe Government Library Service, Salisbury.
REPORT NO	DOK-1099-A/a; S-28-68-81
PUB DATE	Aug 81
NOTE	123p.; Seminar organized with the assistance of Eastern and Southern African Management Institute (ESAMI) and UN-Economic Commission for Africa, Pan-African Documentation and Information System (ECA-PADIS). For related documents, see IR 050 957-959 and IR 050 967.
PUB TYPE	Collected Works - Conference Proceedings (021) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Conference Proceedings; *Decision Making; *Developing Nations; Documentation; Information Needs; Information Retrieval; *Information Science; Information Storage; *Information Systems; *Library Planning; Library Role; National Libraries; *National Programs; Program Development
IDENTIFIERS	*Zimbabwe

ABSTRACT

The aim of this seminar was twofold: to make senior civil servants of Zimbabwe aware of the importance of information and documentation for planning and decision-making, and to introduce the concept of a national information and documentation center (NIDC) as designed by the United Nations Economic Commission for Africa, Pan-African Documentation and Information System (ECA-PADIS). The first half of the seminar was devoted to user education and the promotion and design of a national Zimbabwe information and documentation program. The second half was devoted to special issues of the PADIS concept, including computer requirements, information storage and retrieval techniques, and document analysis procedures. This report includes the proceedings, recommendations, and results of the seminar; the program; a list of participants, lecturers, and staff; reprints of three articles on the seminar that appeared in "The Herald"; and the following addresses and papers: (1) "The Use of Information and Documentation for Planning and Decision-Making" (Dr. F. M. Shava); (2) "A National Library Service as a Focal Point for an Information and Documentation Service for Planning and Decision-Making" (J. L. Culverwell); (3) "The Need for a National Information and Documentation Centre (NIDC) in Zimbabwe" (M. Malianga); (4) "The Role of Libraries, Information and Documentation Centres in National Development" (O. T. Mupawaenda); (5) "Information and Documentation Services in Zimbabwe" (B. L. B. Mushonga); (6) "The Concept of a National Information System in Zimbabwe" (S. R. Dube); (7) "Some Notes on the Use of Data for Planning and Decision-Making" (G. M. Mandishona); (8) "Role of Information in Decision-Making" (A. Musana); (9) "Information Processing: Coping with the User's Needs" (F. Inganji); (10) "Planning Economic Growth with Equity and Implications for Data Systems" (T. R. Muzondo); and (11) "The Computer System Requirements for Zimbabwe's PADIS--NIDC Proposals" (N. B. Chitepo). (THC)

THE NATIONAL ARCHIVES

ZIMBABWE

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED252229

'USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION MAKING'

Seminar organised by

- ZIMBABWE GOVERNMENT LIBRARY SERVICE

with assistance of

- GERMAN FOUNDATION FOR INTERNATIONAL DEVELOPMENT (DSE)
- EASTERN AND SOUTHERN AFRICAN MANAGEMENT INSTITUTE (ESAMI)
- UN-ECONOMIC COMMISSION FOR AFRICA, PAN-AFRICAN DOCUMENTATION AND INFORMATION SYSTEM (ECA-PADIS)

SALISBURY / ZIMBABWE

3 - 7 August 1981

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Dietrich Steinert

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR050969

DOK 1099 A/a
S -68-81

Prepared by

Mr. B.L.B. Mushonga
Dr. T. Moeller

Joint ESAMI/PADIS/DSE-Seminar

on

THE USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION-MAKING

3 - 7 August 1981

Salisbury/Zimbabwe

Summary Report

and

Proceedings

Prepared by

Dr. T. Moeller

German Foundation for
International Development
Education, Science and
Documentation Centre
Endenicher Str. 41

D-5300 Bonn 1

Mr. B.L.B. Mushonga

Zimbabwe Government
Library Service
National Archives
of Zimbabwe
Private Bag 7729, Causeway

Salisbury / ZIMBABWE

TABLE OF CONTENTS page

1. Introduction..... 5

2. Participants..... 5

3. Proceedings..... 6

4. Recommendations and Results..... 6

5. Addresses and papers delivered

Opening address by The Hon. Dr. F. Shava..... 9

Closing address by Hon. Senator J.C. Culverwell..... 12

The Need for a National Information and Documentation Centre (NIDC) in Zimbabwe The Hon. M. Malianga..... 17

The role of libraries, information and documentation centres in national development O.T. Mupawaenda..... 21

Information and Documentation Services in Zimbabwe - B.L.B. Mushonga..... 33

The concept of a national information system in Zimbabwe - S.R. Dube..... 40

Some notes on "The use of data for planning and decision making" - Dr. G. Mandishona..... 47

Role of information in decision making A. Musana (ESAMI)..... 54

Information processing - coping with the user's needs - F. Inganji (NIR)..... 72

Planning economic growth with equity and implications for data systems - T.R. Muzondo..... 93

Computer system requirements for Zimbabwe's PADIS-NIDC proposals - N.B. Chitepo..... 109

6. The Seminar and the Press (articles from The Herald, August 4th, 5th and 8th)..... 115

7. Seminar's programme..... 118

8. List of participants, lecturers and staff..... 121

1. INTRODUCTION

Information and Documentation Services have evolved into Scientific Services which are being used in the Service of progress. A precise knowledge of all relevant facts is an indispensable component of planned development policy, and the information which is the raw material from which these facts may be extracted is stored in libraries, documentation centres, data collection centres and in vast numbers of reports and periodicals. Efforts must therefore be made to promote knowledge of these resources and their organisation particularly where countries of the Third World such as Zimbabwe are concerned.

The importance of establishing information infrastructure in these developing nations like Zimbabwe, has been stressed in the United Nations' World Plan of Action for the Application of Science and Technology for Development, prepared for the Second United Nations Development Decade. The plan states that efforts should be made to provide adequate facilities for the transfer of knowledge among nations, which cannot be accomplished without the existence of proper information channels responsible for collection, treatment and dissemination of relevant data. With this objective in view, this seminar on the "Use of Information and Documentation for Planning and Decision Making" was organized by the

- Zimbabwe Government Library Service with the assistance from
- German Foundation for International Development (DSE),
- Eastern & Southern African Management Institute (ESAMI), Arusha,
- UN-ECA Pan African Documentation and Information System (PADIS).

The aim of this seminar was a twofold one. First to make senior civil servants of Zimbabwe aware of the importance of information and documentation for planning and decision making. And second to introduce the concept of a "National Information and Documentation Centre" as designed by ECA-PADIS. Thus the first half of the seminar was devoted to user-education and the promotion and design of a national Zimbabwean information and documentation programme. The second half of the seminar was devoted to special issues of the PADIS-concept, including computer requirements, information storage and retrieval techniques and document analysis procedures.

2. PARTICIPANTS

Twenty-two senior officers were selected from all the Government Ministries of Zimbabwe to take part in the seminar. For full details please see Appendix . In addition to this, Cabinet Ministers and more senior officers from parastatal bodies were involved in delivering papers during the seminar. Guest lecturers for the first part of the seminar came from ESAMI and the National Institute for Research (NIR), Gaborone/Botswana, while for the PADIS-section ECA-PADIS brought in her own four experts.

3. PROCEEDINGS

The Seminar was opened by The Hon. Dr. Shava, Minister of Manpower Planning and Development, who emphasized the importance of data for planning and decision making. The Deputy Minister of Economic Planning and Development, The Hon. M. Malianga read a paper on the Need for a National Information and Documentation Centre in Zimbabwe. Towards the end of the seminar Mr. A.Musana, Librarian of the Eastern and Southern African Management Institute; Dr. T. Moeller of the German Foundation for International Development and Dr. Quirino-Lahounmey, Director of PADIS, all gave brief speeches on the activities of their respective institutions.

The closing address of the Seminar was given by Senator Culverwell, Deputy Minister of Education and Culture who thanked the sponsoring bodies and pointed out that his Ministry was very interested in the subject of the Seminar. He emphasized the importance of information in planning and decision making and the need to integrate the National Information and Documentation Centre with the National Library Service.

Maximum advantage was taken to publicise the Seminar to the general public through the press, radio and television throughout the week.

At the end of the seminar all the participants were agreed on the importance of information and documentation for planning and decision making. Officers from Ministries without library or documentation service were already pressing for this service. Interest on the question of the National Library and Documentation Service was kindled both in the Government and among the public. The need to co-ordinate the various information systems e.g. AGRIS, UNEP, IANIS, NATIS etc. within Zimbabwe was also felt soon after the Conference.

4. RECOMMENDATIONS AND RESULTS

The recommendations made throughout the Seminars were:

i) that Librarians, Information scientists and Documentalists should be consulted on all matters relating to their field.

ii) that each Ministry and Department should actively build up an information resource centre to back up the planning and decision making process.

iii) that Librarians, Information scientists, Documentalists and planners in all Ministries should continually assess their data banks and make positive action to fill in any gaps that may exist through research work.

iv) that the creation of a National Documentation and Information Centre in Zimbabwe was a necessity and that all Ministries and Departments should be involved in planning the establishment of such a centre.

v) that traditional methods of data handling have their own serious limitations when it comes to the storage and retrieval of data. That these limitations may be circumvented by the use of electronic data processing, hence the need of the National Information and Documentation Centre.

As a result of the Seminar a Steering Committee for the National Library and Information Council was set up with representatives of several Ministries. The functions of the Committee are:

i) to co-ordinate the creation of a National Library Service and Documentation Centre

ii) to formulate and advise Government through the Ministry of Education and Culture on policy relating to (i)

iii) to create the National Library and Documentation Council.

The Steering Committee has now met three times since the Seminar and the inauguration meeting for the National Library and Documentation Council will be on 28 October 1981. This Council will be the one that will be responsible for advising Government on coordinating all documentation and information systems like NATIS, PADIS, NIDC, AGRIS etc. There is also a debate going on in the country about whether there should only be one Computer Centre for the Government Departments or each Department to have its own computer if the need is there. Whatever the result of this debate might be it would seem that the National Information and Documentation Centre (NIDC) when established will either have its own computer at the National Library Headquarters or be on-line to the Central Computer Centre. General consensus is that the NIDC should be an integral part of the National Library Service.

The Zimbabwe User Seminar was very effective for the interest it generated among Government Ministers and officials about the importance of information and documentation for planning and decision making.

In general, from reports received from participants, and other government officers, and the developments that have taken place as a result of the Seminar, it appears that the Seminar was a resounding success.

THE USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION MAKING

Opening speech by

THE HON. DR. F. M. SHAVA

Minister of Manpower Planning and Development

Ladies and gentleman, on behalf of the Government, I would like to extend a warm welcome to the visiting participants of the Seminar on The Use of Information and Documentation for Planning and Decision Making. I wish to thank too the organisations who have made it all possible by giving unstintingly aid in terms of financial aid and their precious time: The German Foundation for International Development, without whose initiative and financial aid, the seminar might have been a non-starter, the United Nations Economic Commission for Africa, Pan-African Documentation Information System for their eager sponsorship and the Eastern and Southern African Management Institute and the Botswana National Institute for Research for taking time to contribute some of their expertise. I welcome all of you and hope you will have time to enjoy your stay in our country as well as having a fruitful seminar.

The Subject of your seminar, ladies and gentleman, is one in which the Government is very sensitive too. We believe that in order to plan and make decisions, one has to have all the relevant data available. My Ministry's National Manpower Survey is just one example of the importance we attach to information and data in any planning and decision making process. The aim of this survey is:

(1) To assess the size and structure of the present employment of professional, skilled and semi-skilled manpower

(2) To assess the potential of professional and skilled Zimbabweans abroad who could become available to work in Zimbabwe

(3) To assess existing shortages with regard to professional, skilled and semi-skilled manpower

(4) With the above information to formulate short, medium and long term policies for education and training of Zimbabweans and for their advancement.

Decision making or problem solving is a complex process in which the following conditions hold:

1. (a) Two or more values are affected by the decision arrived at
   (b) There is a trade-off relationship between the values such that a greater return to one can be obtained only at a loss to the other.
2. The power to make the decision is dispersed over a number of individuals and/or organisational units.

The trade-off relationships I have just mentioned can arise for two reasons. First, it is a basic fact of life that any significant effort to produce an intended outcome consumes resources - time, money, managerial talent, political opportunity, or whatever. Since resources devoted to one purpose are unavailable to another, it is for this very reason that information and documentation will play a major role in assisting the decision maker and planer to make sure that whatever plans or decisions they make will give a greater return to society than any other decision. We are living in a period of technological change. Other countries are more advanced than others. Therefore we in developing countries have to rely on information and documentation to pick on the right and most suitable technologies for our own countries. Information reduces the extent of uncertainty about the effects of the plans and decisions we adopt. The availability of data or information enables the planner and decision maker to know before hand the range of possible outcomes that his plan or decision is likely to bring about.

In planning and decision making one asks oneself the following:

1. "What is the problem?"
2. "What are the alternatives?"
3. "Which is the best alternative?"

To answer all these vital questions the planners and decision makers need to have information or what in military parlance is called "intelligence". Although "wisdom", "judgement" and "intuition" play an important role in decision making, they are not the sort of qualities which can easily be taught to others and they are also very subjective. For objective planning and decision making the decision maker needs to have all the relevant information and data at his disposal. This is why the theme of this seminar is a very important one.

I will not take any more of your time to outline what is being done in Zimbabwe in the field of information and documentation services because that aspect will be adequately covered by the Senior Government Librarian.

With these few comments I now take the pleasure of declaring the Joint PADIS/ESAMI/DSE Seminar on the use of information and documentation for planning and decision making duly opened.

A CLOSING ADRESS BY THE DEPUTY MINISTER OF EDUCATION & CULTURE, SENATOR J.L. CULVERWELL, TO THE JOINT ESAMI/PADIS/DSE SEMINAR ON THE USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION MAKING. 7th August 1981 at the Ambassador Hotel.

A NATIONAL LIBRARY SERVICE AS A FOCAL POINT FOR AN INFORMATION AND DOCUMENTATION SERVICE FOR PLANNING AND DECISION-MAKING

Mr. Chairman, Your Excellencies, Comrades and Friends, it was a very great pleasure indeed for me to accept your invitation to come and give the closing address for your week-long seminar. My reason for accepting without any hesitation was not so much that I have expertise to share, but that I thought I could take this opportunity to share with you some of the thoughts which we in the Ministry of Education & Culture have about a planned National Library Service in Zimbabwe.

Mr. Chairman, I notice from your programme that you have been discussing wide-ranging topics about the "Role of Information in Decision-making". You will no doubt agree with me that often when people talk about decision-making and planning, we automatically think of big plans and very grave decisions. We forget about the housewife who must plan her domestic economics and the market gardening co-op which must decide what crops to plant at any given time of the year. In other words there are two ends of the user market for the information and documentation service, the macro-planner and decision-maker and the micro-planner and decision-maker.

In Zimbabwe, poised as it is to take giant steps in economic development we cannot afford to ignore the needs of both these sectors of the information users. Our plans therefore are for an integrated National Library Service which will underpin the plans for development. For it is clear to us that if the main thrust of our national development programme is aimed at the rural areas, then our National Library Service must also serve that sector. This is a significant departure from the policies of the past regimes which saw access to information as a threat to their egg-shell of shortsighted planning.

In planning a National Library Service we are seeking to promote access to information and documentation as part and parcel of the national plans for economic and social development. Planning of library and information services in this way is a relatively new concept and we are therefore very fortunate that in Zimbabwe this is taking place at a time when our national development plans are still on the drawing boards in the main.

Some of you, including you Mr. Chairman, will be aware of the fact that one of the first things which my Ministry did after the establishment of the Division of Culture, was to invite a consultant from Britain who made some recommendations for the creation of a National Library Service. His recommendations have provided the basis of our three year library development programme. This will, briefly, include the establishment of a national library headquarters in Salisbury which will serve regional libraries in Matabeleland, Midlands, Victoria, Manicaland and Mashonaland. The regional libraries will be in turn responsible for running a mobile library service which will operate in all the districts.

With this brief background, it is most opportune that we should be discussing the need for a National Information and Documentation Service in Zimbabwe now.

In our view, any approach which advocated the creation of facilities for an information and documentation service separate from a national library service would be ill-conceived and uneconomical if it results in the duplication of equipment and other common services which an integrated National Library service could provide. I am thinking, Mr. Chairman, of the need to use a computerised system of information storage and retrieval the document processing for microtexts, tapes and filmstrips, and indeed I am also thinking of a centralised bibliographic service. In saying this Mr. Chairman, I am taking cognizance of the fact that in speaking of a National Library Service, we must now think of libraries more as communication or information centres rather than merely as book distribution centres. Therefore, the distinction which others might seek to make between libraries nad documentation centres has very little meaning, particularly in a developing country such as Zimbabwe.

This is therefore an appeal for planners of an information and documentation service not to work in isolation from the library service. For to do so would result in the creation of an ivory tower for the macro-planners which would be divorced from the development needs of the majority of the people, for whom the development plans are intended. With an integrated information and documentation system, the National Library Service should ensure a sustained free flow of information where it is needed at all levels of our national development programme.

In proposing an integrated National Library Service, we are hoping to create a National Library Council comprising representatives of the main user agencies and professional bodies which will both deposit and retrieve information and documentation into and from the service. Such a council would monitor the service to ensure that it will respond equitably and adequately to the needs of diverse types of public users. But more immediately the council would consider the requirements of the establishment of an integrated service. I am therefore hoping that before long the views of all concerned will be sought by the designers of the planned library facilities. Mr. Chairman, we shall seek your assistance and that of others who have been participating in this seminar to ensure that full account is taken of the various needs.

I must now turn to the vital question of manpower to run such a service. I realise, Mr. Chairman, that you have been discussing training needs this morning, and I wish to assure you therefore, that we look forward to receiving your recommendations. If I should appear to steal your thunder or take the wind from your sails in any way, then that could only be a very happy coincidence.

Compared to other countries, the library profession in our country is still in its infancy. We consider this to be somewhat of an advantage if it means that Zimbabwe can train its own librarians. As I see it, this would mean the training of librarians who are not just custodians of books, but genuine community leaders for development. For, the librarian of the future must shed the image of the grave long-faced man of learning which is of course compatible with the deathly silence of the traditional library. Rather the librarian

we must seek to produce should be more of a shopkeeper standing ready to serve the needs of the literate as well as the non-literate to whom if information in one form or another is denied then some of the democratic rights on which our new society is firmly based will also be denied to them. We therefore attach great importance to the establishment of a training scheme for librarians almost along the same lines as the emergency programme of the ZINTEC by which teachers are being trained.

Such a training scheme would help to focus attention on the need for the creation of a proper career structure for the librarians. We therefore wish to take a long-range look in planning a training programme. A preliminary plan for the training of librarians should be drawn up over the next few months. Such a plan would specifically seek to narrow the gap between traditional librarianship and what could be called "information science" by recognising that they are both equally concerned with communication services, their development, operation and administration, thereby removing the past rigid stratification of library and information personnel.

In discussing these plans we cannot afford to be unmindful of the fact that no economic and social development takes place in isolation. Zimbabwe is an active member of the (SADCC) Southern African Development Co-ordinating Conference nearer home, and of the O.A.U., UNESCO and other similar scientific research and economic co-operation bodies. The decisions which we make here are bound to have a ripple effect on the decisions which others have to make and vice versa. We therefore have an obligation to consult with our neighbours in the hope of standardising our information and documentation services. Mr. Chairman, I take note with great delight of the presence at this seminar of representatives from the E.C.A., from Botswana and from Tanzania. Their presence will go a long way to reinforce the lines of communication which already exist. We appreciate the initiatives which were taken to organise this seminar.

And in bringing the seminar to a close, I wish to thank you Mr. Chairman, once more for having afforded me this opportunity to come and publicly associate my Ministry with your deliberations. I shall look forward with great interest to your own proposals and I hope that the door which you have opened with this seminar will remain wide open for a greater sharing of ideas about our mutual interest in the provision of an integrated information and documentation service in pursuance of our national goals for development.

I wish to take this opportunity to wish our visitors a very safe journey home and assure them that they will always be most welcome here.

I thank you.

JOINT ESAMI/PADIS/DSE

SEMINAR

The Need for a National Information and Documentation Centre (NIDC) in Zimbabwe

by

The Hon. M. Malianga

Deputy Minister of Economic Planning and Development

I feel honoured to have been invited to address this seminar, which I am made to believe is the first of its kind - honoured not only because it is the first, but also because my country is privileged to be host to this very important gathering of information and documentation scientists.

Whether there is a need for a national information and documentation centre in Zimbabwe could be a debatable issue. Indeed some will argue that this country and this economy have managed all these years without one and could conceivably continue to do so. Others will endeavour to weigh the costs of such an institution against that of immediate provision of the population, for example. Yet still others will contend that at this stage of our development, nationally and continentally, a sophisticated system such as PADIS proposes, becomes a luxury. Mr. Chairman, it is my view and that of my government that such arguments would be out ignorance of planning and decision-making processes and their concommitant needs for information.

After nearly two decades of independence, our African Governments continue to fall prey to ineffective planning of their economies. Increasing dependence on foreign and international organizations for conducting research and planning are a common phenomenon among our nations, and the institutional and infrastructural mechanisms for the exploitation of information resources have remained generally underdeveloped.

Limited development has taken place in respect of integrated documentation of papers, appraisals and documents. Apparently far less appreciated has been the necessity for a systematic explicitation, on a national basis, of information resources.

African nations have, by and large, emerged from similar experiences - a long history of colonisation, underdevelopment, exploitation, dehumanising social and cultural rape. In the post-colonial era, the struggle toward self-reliance and socio-economic development has necessitated great emphasis being placed at the formulation of national development plans aimed at improving the quality of life of the masses, and on their implementation. This struggle and emphasis has taken place not withstanding persistent and articulate manouvres of imperialists to strangle and destabilize our economies, and enforce our dependence on them. Yet, year after year, we have found ourselves compelled to call upon our imperialist "friends" to return once more and aid us in research, policy-formation and planning. Where has all this manfold experience disappeared to, that we fail to draw on that wealth of knowledge which has been collected about our continent? I do not mean to deride the assistance Africa has received from outside our boundaries - quite the contrary. All development includes a process of learning, learning from those that have crossed certain bridges before us. But this

development process in itself constitutes a global exercise of the activities of a people as a homogeneous entity, and their many and varied recollections and espirations. It is in our interest in Africa to learn from one another, from those that have been before us, and to consolidate our efforts. This was the spirit in which the United Nations Economic Commission for Africa Conference of Ministers adopted a resolution that lead to the creation of PADIS, and charged it with the acceleration of wide-spread development of capabilities in the various fields of technical, social, and economic development, vital to increasing self-reliance among African states.

Besides the vertical and national dimension which takes full cognizance of the set of socio-economic objectives of the state, there is the horizontal and international dimension which demands viable and concrete programmes of co-operation. Neither the one nor the other dimension can be treated independently when the attainment of economic deliberation of our continent is our ultimate goal. PADIS is seen as a catalyst for improving the capacity of African countries to make maximum use of the information generated and collected on national and continental levels. A first step towards an integrated continental information network, PADIS, in supporting the establishment of information and documentation centres, will strengthen the national information infrastructures of ECA Member states. That when information on our countries is required for planning and decision-making by our governments, this is all too often better documented and more readily available in the cabinets of the United Nations, the World Bank and certain overseas intelligence agencies, is not only a dangerous anomaly, but a misfortune and a great pity! It is a fact that a vast amount of the considerable wealth of research that has been and continues to be conducted on our continent mainly by expatriates and a significant proportion by nationals, is "lost" in University libraries on our continent and abroad, or put on the shelf so-to-speak in government registries. I say "lost" because a great deal of these invaluable research reports are no longer accessible to subsequent researchers, nor to planners and decision-makers. Surely we must act quickly to redeem ourselves and reinforce our hard-won political sovereignty by adopting and implementing effective programmes for the achievement of economic independence.

In this context, a prerequisite to meeting national objectives is the removal of social, cultural and political obstacles hindering free exchange of information, the encouragement of research into finding suitable ways and means for the continuous improvements of the standard of living of our people and finally the planned development of institutions for the systematic exploitation of information resources.

Here in Zimbabwe, especially at this time when attention is focussed on our development path, there is a crying demand for information from within and outside our boundaries. Had we inherited a system of institutions geared for a planned economy, the situation would have been different, and indeed the task of planners would have been simplified.

As it is, not only was the institutional framework for the dissemination of information poorly organised, but in the interest of the past illegal regimes, was undermined intentionally and meticulously.

Particularly during the years when sanctions were inforced on this country, a considerable amount of information was classified, destroyed or not compiled at all. To say that information was classified, and this was mainly that relating to production and trade, is to omit a large proportion of the picture as to what information was gathered at all. A constant reminder of the place our people were forced to take under colonialism, is the dearth of information on Africans generally. Hardly any figures or reports were collected on the needs or living conditions of the indigenous people of the country. This, however, does not come as a surprise from a system which took account of the needs of the African people only in as far as they were consistant with those of the whiteman. It was to be expected from regimes that regarded the African as no more than a reservoir of cheap labour.

Where any research has been conducted on the quality of life of our people, most of this has been by academics, for their own ends and not necessarily policy-oriented. Policy-makers in Rhodesia would not have been encouraged, nor have encouraged this type of work, but policy-makers in Zimbabwe hunger for such research reports. There should be a concerted effort to retrieve all that we can that will be of use to our planners now as we construct the foundation for the society we desire.

Even now, committed as we are to evolve a socialist, and therefore implicitly a planned society, government is finding it difficult to present the people with a full-fledged National Plan as would have been ideal. This is not because there are not the people competent to prepare our plan, for we can even borrow expertise if need be. Nor is it because time does not allow a detailed preparation entailed. While one reason is that we are at a reconstruction and rehabilitation stage, a far more important constraint is that our information resources, vital to effective planning, are lacking.

The National Information and Documentation Centre will concern itself with the collection of numerical and non-numerical data for economic and social development and provide easy access to published and unpublished information generated within and outside the country. Definitely, we shall from time to time want to refer to the experience of our sister nations of Africa. But let us not get carried away with this impending exciting possibility. For it could conceivably become easier to gather information on other countries than our own, and this is where the cultural and political obstacles I mentioned earlier come to bear. It is important that the distance be bridged between researchers, independent fieldworkers and analysts on the one hand and planners and policy-makers on the other hand. A major reason for the existence of this lack of communication has been and still is mutual suspicion.

The National Information and Documentation Centre can and should play an important role in removing such obstacles and as such become more than just a facility for procurement of information. From its very inception, this new centre will be challenged with the introduction of revolutionary concepts in information gathering dissemination, promotion methods and standards.

We are not in need of just another main library, archive or computer centre, not even more sophisticated and better organized than what exists. Rather we look to this new establishment to play that vital role of examining information sources that are available, with the specific objective of enhancing and developing a well-defined and effective structure for the diffusion of information. The centre should become the focal point for institutionalized contact between users and generators of information.

Unless the benefits of a freer exchange of information are recognised and a freer system of information exchange established our researchers, scientists, technicians, financers and industrialists will continue to collect very valuable information which they will keep to themselves and which will never reach those responsible for decision-making. It is hoped then that NIDC will, as set out in its objectives, create the vertical and horizontal link among sectoral and universal files existing within the country, and serve to coordinate and stimulate data exchange.

Mr. Chairman, in closing I would like to record my great enthusiasm and appreciation that these deliberations are taking place to determine not whether but how we can improve on our information network. More exciting is the fact that this is part of a continental effort, and as such demands that we in Zimbabwe contribute that much more. We have long awaited and waged a war for these opportunities to take our place in the ranks of the African struggle for economic independence. The realization of the Pan African Documentation and Information System, of which Zimbabwe's centre will form a part, is a bold and crucial step in that direction.

Mr. Chairman, Ladies and Gentlemen, Thank you.

JOINT ESAMI/PADIS/DSE - SEMINAR ON "USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION-MAKING" 3-7 AUGUST 1981

THE ROLE OF LIBRARIES, INFORMATION AND DOCUMENTATION CENTRES IN NATIONAL DEVELOPMENT

by O.T. MUPAWAENDA

The people of Zimbabwe have been observing with great interest, enthusiasm, hope and expectation the many conferences, symposia and workshops, on various aspects of the Zimbabwean economy, which were organised and conducted during the first twelve months or so of the post independence period. One of the most important of these debates was the Zimbabwe Conference on Reconstruction and Development - ZIMCORD for short.

The event was given wide publicity, the news being disseminated via newspapers, the radio, television and, last but not least, the grapevine. As you can well imagine it was interpreted in a variety of interesting ways. One elderly man from a remote country-side village, argued quite vehemently that, as a result of ZIMCORD, Zimbabwe had ingeniously found an all-time solution to all its economic problems. He maintained that since ZIMCORD had managed to raise about Z$ 1 000 000 000 and the population of Zimbabwe is only just over 7,000,000, the question was now one of simple arithmetic. Divide the Z$ 1 000 000 000 by the 7,000,000, and you will get a nation of multimillionaires including babies - just like that! This is only one of the many dramatic examples one could cite to illustrate the nature, complexity and magnitude of the hydraheaded problem of national development, especially in Third World circumstances. It raises the whole vital question of how any government under those conditions can effectively communicate and disseminate accurate information to the majority of its people at the right time to avoid a situation in which..." a lie can travel half way round the world while truth is still putting on its shoes" as Mark Twain put it.

Libraries, information or documentation services, as we know them today, came into being and developed largely because of, and as a result of, the literate world in which we live. Their raison d'être is to support and promote the literate society in which individuals, groups and organizations need, want, require, demand or use information in the course of pursuing their diverse interests in different ways and situations and for a variety of reasons. Libraries are traditionally associated with the acquisition, organization and retrieval of documents, while information services are expected to deal with information itself. Examples of the former include school, public or special libraries, as we shall see later. The latter are represented by the Zimbabwe-Africa News Agency, Zimbabwe Broadcasting Corporation, Zimbabwe Television and the like. The modern idea is that, in the final analysis, they are all really concerned with handling the intangible and unsubstitutable commodity or resource called information.

If and when properly organised and managed, libraries and information services can, should and do support, stimulate, facilitate and promote national development by creating and developing conditions in which the multifaceted process of lifelong education, the communication and diffusion of knowledge, ideas, skills, techniques and information, in all its multiple and varied forms, can flourish. There is already substantial evidence to suggest that where national development planning and the implementation of related programmes are supported by adequate, reliable and up to date information services, the results tend to be more satisfactory both in terms of target achivement as well as the use of planning as a tool for minimising big surprises or suicidal risks. What has often tended to be overlooked in many developing countries is the need to make libraries and other information services an integral part of national development plans. The recently published Report of the Riddell Commission of Inquiry into Incomes, Prices and Working Conditions in Zimbabwe revealed two items of information which serve to reinforce my arguments. The non-availability of essential data about the poor, especially those in rural areas, and the government's plan for the resettlement of about 33,000

families on land over the next two years whereas the Commission estimated that something in the neighbourhood of 185 000 families would need to be resettled.

These are aspects of the same big problem of lack of information services to provide decision makers and planners with reliable, up to date information. The Zimbabwe National Manpower Survey slogan has put it in a nutshell..."without facts we cannot make accurate decisions".

Let us now look at the different types of libraries and information services, their activities and how they contribute to national development.

The very first experience and involvement with an information system is, no doubt, the home environment in which the parents, especially the mothers, are the human encyclopaedic sources of all information and knowledge in general. In many countries today, the production of colourful story books and magazines, a wide range of drawing and painting materials and a bewildering variety of toys and educational games for pre-school children, has developed into a thriving multimillion industry. In book-orientated homes, children see their parents read and write. All these conditions and circumstances tend to facilitate the children's mental development and to inculcate the reading habit which could be crucial not only to their future lives but also to national development. By the time these children are ready to go to school they should already have acquired an appreciation for books and how these can be exploited to one's benefit.

School libraries are an invaluable instrument for shaping and sharpening knowledge, tastes, attitudes and values. They enrich the educational process in schools. Hence, they are or should be regarded and recognised as an integral part of any formal education system. The modern teaching techniques are changing or have changed from the spoon-feeding, chalk-and-talk methods to the idea of self-directed learning, independent study and research. The aim being to create a society of initiative-orientated, self-reliant, creative and inquisitive thinkers and not human sheep. Without this science and technology, or any other field for that matter,

are unlikely to make major significant advances, while original discoveries become few and far between. When pupils have an opportunity to read widely so as to compare different viewpoints and evidence, they tend to understand without memorizing rather than memorize without understanding. Furthermore, school libraries could be expanded into materials centres where appreciation and critical appraisal of national cultures, drama, film, radio and television programmes could be promoted. At a time when many classes are large and teachers in short supply, school libraries are destined to play a vital role.

In developed countries, public libraries have become freely accessible multi-activity centres catering for all age groups, tastes and interests in local communities. They acquire and make available anything from manuscripts through printed records to information on computer magnetic tape, disc or drum.

It is not unusual to find coffee bars, theatres, language laboratories, music sections, study, reference and research areas in public libraries. The idea is to provide wide-ranging facilities for all kinds of recreational, cultural, intellectual, social, general professional and pragmatic needs of a community so as to facilitate and encourage the all-round advancement of the individual and, directly or indirectly, promote national development. The educational process continues, and must continue, throughout life.

Special libraries serve a specialist clientele which may be located whithin a single establishment or group pursuing a common goal. In their present form, they began to develop at the beginning of the twentieth century in response to the increased pace of scientific and technical achievement. The successful launching of the first Russian Sputnik in 1959 is a case in point. The event led to a boom in the writing, publishing and acquisition of technical information, particularly in Russia, America and other world powers. But, of course, scientists have always exchanged ideas even before Archimedes jumped out of his bath tub to announce and disseminate his discovery of specific gravity.

The term "special" embraces commercial, government, industrial, medical, scientific and technical libraries. It includes libraries and information services of research establishments, business enterprises, professional and learned associations or societies. A special library enables professional and research personnel to keep abreast of current research and up to date information relevant to their organizations' interests. It is vital in such work to avoid dissipating valuable time, effort and money in duplicating or recreating existing knowledge or making slow progress because of being unaware of the latest in one's field. This may lead to a wasteful "re-inventing of the wheel".

The fourth major category of libraries is the academic library whose principal objective is to further the academic, intellectual or vocational interests of its parent organization, whether it be the university, polytechnic, college of teacher education or any other institution that promotes tertiary education. One could also argue that an academic library is, to a greater or lesser extent, a special library which may or may not have a number of specialised units within it. The Library of the University of Zimbabwe is a good example.

The Main Library covers all subjects taught in the University but, because of the special needs of some faculties or departments, four branch or specialised libraries came into being - the Law, Education, Map and Medical Libraries. The main objective of the whole library system is to facilitate and support study, teaching and research in the University and also research in the country generally.

The last but not the least type of library is the National Library which is/should be responsible for preserving for posterity the whole of any country's written, printed or recorded output and ensuring that bibliographic work proceeds on uniform lines.

The National Library should seek to provide as much essential information as possible in all subject fields to enable research and study to be carried out. This, it must be admitted, remains only an ideal as it is well-nigh impossible for any one library to be so comprehensive.

One can, therefore, deduce from the foregoing account that libraries and information services handle an indispensable resource which is a most essential input in the educational process and, consequently, the development of any nation. In theory, there appears to be widespread agreement that libraries are A GOOD THING but in practice they have tended to be the Cinderella of national development plans.

In my humble but honest opinion, the situation regarding the provision of library and information services in Zimbabwe, at this juncture, leaves much to be desired, to put it mildly. The problems which must be overcome are numerous and complex but not insurmountable.

ILLITERACY

The very first real big problem is illiteracy. It is estimated that the rate of literacy in Zimbabwe is about 46%. The Adult Literacy Organization of Zimbabwe, which runs literacy classes throughout the country, imploys more than 240 teachers and has about 14,000 students in 212 centres. The organization concentrates on the estimated 1,4 million illiterate adults, most of whom live in the rural areas. The vast majority of illiterates are women - one of the obvious results of social prejudice against the education of women in the past. The position of women is a crucial area, especially when one considers that parental participation is recognised as an important element in both formal and informal education. The role of women in national development in general is even more important, as was emphasized in the ZIMCORD.

It is estimated that between 55 - 60% of the total population of Zimbabwe are under 15 years of age. These are the young people who will determine the course of national development in future. Therefore they must be adequately trained to assume adult responsibilities. At present, it is most unlikely that more than 65% of primary school age children are taking advantage of the opportunity for free primary school education being provided. This indicates that, if the necessary corrective steps are not taken, the young people, too, may fall into the morass of illiteracy. Any govern-

ment knows/must know that the communication and dissemination of its policies, plans, programmes, laws, official pronouncements, etc largely depend on the printed word and the mass media which in turn must depend on literacy, general education, awareness and understanding on the part of the intended target audiences, i.e. the masses of the people about 90% of whom live in the rural areas.

There are, of course, various levels and degrees of literacy. Such concepts as budget, inflation, foreign currency, money and so on require a much higher degree of literacy. As long as illiteracy is not either considerably reduced or eventually completely eradicated at every level, the process of national development is bound to be hampered by the severely limited productive participation of the majority of the people.

LACK OF LIBRARY SERVICES

The second biggest problem is the non-existence of free national library services and facilities for those who are literate. The huge investment which goes into formal education every year is almost completely wasted if reading facilities and reading material are not provided for follow-up reading because the new literate can very easily slip back into illiteracy. There is also a large number of people who, for various reasons, were unable to get a formal education but are quite keen to study privately in order to obtain an academic or a vocational qualification. It is not unusual to see a young student reading by street light in what used to be called African Townships. The University of Zimbabwe Library is inundated with requests from young people studying "O" and "A" levels through correspondence and members of the public wanting books or information to advance both their general and vocational interests.

In the rural areas, the position is much worse and yet that is where the need is greatest. The remote villagers will, from time to time, need up to date information on vegetable gardening, cookery, hygiene, sewing and a host of other items related to their day-to-day problems. Those who have the expertise in such matters live

far away from the villagers or are concentrated in urban areas. Above all, everybody wants to know, and must know, what the government is doing - its plans, programmes and its problems. The reactions of the people and the necessary feedback must also be communicated to government through definite, reliable and traceable channels. All these things cannot be adequately fulfilled without literacy, libraries, information services and raising the general levels of education. Some might argue that every person has the right and freedom to remain ignorant, but that is wrong because it interferes with other people's freedoms.

UNSUITABILITY OF AVAILABLE READING MATERIAL

The few libraries that are available to those who are literate contain unsuitable reading material especially for the indigenous citizens. The bulk of the books and other library materials found in many parts of Africa are written, printed and published in Europe, North America and other developed countries. Africa contains about 9,4% of the world's population but produces only 1,5% of the total number of books printed in the world every year. The developed countries produce as much as 135 to 200 times more than Africa. It is, therefore, not surprising that African countries like Zimbabwe will continue to import increasingly expensive library materials from outside Africa.

The basic problem is that the whole industry associated with writing, printing, publishing and the economics of the book trade is still either in its infancy or underdeveloped. The developing countries should plan and develop their own book production and distribution industries which must involve the entire book community, i.e. writers, publishers, booksellers, librarians and other interested parties. In Zimbabwe, writing and publishing will have to be promoted in the three major languages - Shona, Ndebele and English. The last mentioned is the official language, which it seems is one of the few acceptable vestiges of colonialism!

There are a number of ways in which this could be done.

(a) The organisation of workshops, seminars and conferences on

various forms of writing and literature, reinforced by book fairs, exhibitions and prize-giving competitions at various levels throughout the country.

(b) The production of simple, problem-orientated literature about the immediate environment, including the work place, should be positively encouraged. Subject specialists could be sponsored or commissioned to write about conservation of land, water, forests, the prevention of air pollution, veld fires, work-related accidents, diseases, etc, and the country's laws relating to all these subject areas.

(c) The indigenization of school curricula can be effected either by complete revision such as the rewriting of history or by adaptations and translations from suitable foreign texts. The introduction of free education, its expansion and development should provide a sound market for writers and publishers in this field.

(d) There are vast areas of virgin land in terms of primary research, particularly out in the countryside. The enormous wealth of information about oral history, traditional customs, medicine, drama, poetry, music and technologies can be obtained from the older generation before it is too late.

(e) In a country which still has a considerably large population of illiterates, the use of audio-visual materials can be a more effective method of communication than the printed word. Ivan S. Turgenev once said..."a picture may instantly present what a book could set forth only in a hundred pages".

While it is appreciated that some valuable library materials have emanated from the developed nations, one must register strong opposition to the use of developing countries as dumping grounds for unwanted and sometimes hopelessly dated publications. It cannot be denied that language and literature are precooked, prepackaged and artificially flavoured by their authors depending on the dictates of the society and the environment in which they are produced and used. It is in these circumstances that the hand, the head and the heart are trained and conditioned. By all means let us keep an open mind. Unfortunately, everybody will be tempted to keep throwing rubbish in it.

LIBRARY RELEVANCE

Library and information services are likely to be better appreciated and to have the intended impact if and when they become more people-orientated and problem-solving systems than hitherto. They should be organised in such a way as to become active instruments of individual mental liberation and socio-economic revolution. The problem which deserves the most urgent attention in Zimbabwe, and many other young Third World countries, is the need to revolutionize the thinking and attitudes of the young people in particular so that they are better able and prepared to apply problem-solving techniques that are relevant to their local situations. The few available libraries are, as was pointed out before, miserably lacking in information which is relevant to the day-to-day problems and interests of the vast majority of the people. Nobody wants information per se, but only as a means to an end.

The Third World library, especially the public library, will have to operate as a more or less informal, multi-activity and multi-media, cultural, social and general information centre, accommodating the literate and illiterate alike. It can or shold be used as a meeting place for group discussions of central government or local authority policies, programmes and activities, traditional story telling, song and dance, development-orientated films, radio and television programmes. If the word "library" is inappropriate for such a centre, then, by all means, let us invent another word without delay.

INFORMATION INTERMEDIARIES

It is the librarians and information specialists who are at the centre of it all. They have to be all things to all men. It is they who must find and acquire the relevant information, organise and make it available to those who need it, at the right time in the right place. In order to carry out such an involved multi-dimensional task, they have to be a dedicated and skilled fraternity of professionals supported by adequate funds, the necessary materials and, above all, the central and local government organs and various other information producers and consumers.

The responsibility for national development is so heavy and so important that the decision-makers and planners in every sphere of human activity have to work in very close collaboration with those who are in the information profession.
It is up to the information "specialists" themselves to prove and demonstrate their ability, professionalism and preparedness to provide and promote development-orientated library and information services.

CONCLUSION

In conclusion, I must say that, in this day and age, it is difficult to imagine a situation in which anybody can learn anything without having to acquire information or knowledge from some source except, I suppose, those who have extraordinary powers of intuition, fortune-telling or extrasensory perception, all of which seem to have very severely limited practical application in terms of solving the many complex problems of modern life. Otto von Bismarck had occasion to declare that..."the clever man learns from the experiences of others". A good information or library service facilitates that learning. Information itself is a curious commodity. It costs a great deal of money, time and effort to acquire and organise it, but to do without it costs even more. It has been said that nations, organisations or individuals never plan to fail; they just fail to plan.

The message of this paper is directed "to whom it may concern".

REFERENCES

1. EVANS, A.J. et al. Education and training of users of scientific and technial information: UNISIST guide for teachers. Paris: Unesco, 1977.

2. JOHNSON, E.D. Communication: an introduction to the history of writing, printing, books and libraries. 4th ed. Metuchen: Scarecrow Press, 1973

3. OLDMAN, D. The value of information. Bradford: MCB Management Consultants Limited, 1976.

4. ROWLEY, J.E. and TURNER, C.M.D. The dissemination of information. London: Deutsch, 1978.

5. STANDING CONFERENCE OF EASTERN, CENTRAL AND SOUTHERN AFRICAN LIBRARIES: Libraries and information services as instruments of transition to the 21st century in Africa: proceedings of SCECSAL 2, Lusaka, October 4-9, 1976. Lusaka: Zambia Library Association, 1978.

6. WEISMAN, H.M. Information systems, services and centers. New York: Wiley, 1972.

INFORMATION AND DOCUMENTATION SERVICES IN ZIMBABWE

by

B.L.B. Mushonga

Senior Government Librarian

Government Library Service

DEFINITIONS

Information may be defined as knowledge acquired in any manner, and this would include facts; data; learning or lore. Documentation on the other hand is the recording, organising and dissemination of specialised knowledge. In Zimbabwe we do not have a clear distinction between an information service and documentation service. We find that in the majority of cases the functions of these two services are being carried out in libraries. It may be pertinent to point out at the outset that the concept "information" as denoted in this seminar and indeed in the library field is somehow different from the concept "information" as understood by our Department of Information in the Ministry of Information, Immigration and Tourism. The Librarians, Information Scientists and Documentalists are interested in the recording, organisation and dissemination of specialised knowledge, I repeat, specialised knowledge.

INFORMATION

Information is the new basic resource which supplements the familiar natural resources of matter and energy. Stores of information represent a new kind of transactable commodity, ranking in future human importance alongside material and energy resources. Control of information stores and processing facilities may well become more important than material and energy resources as a source of social and economic power. A wider dispersal of information may lead to a reduction in importance of the few specialists who hold power because of special knowledge. In this country it is particularly so in the field of commerce, manufacturing and engineering. Because a certain sector of our community had access to knowledge of fast moving and profitable products, it went ahead and either manufactured or imported these products and because of ignorance about this information few or none of our black people thought of going into these business ventures. This is where information is vital for good decision making.

Easy access to knowledge could become a great equaliser among traditionally unequal intellectual, economic and technological competitors, just as firepower has sometimes served to equalise otherwise unequal physical competitors.

INFORMATION REVOLUTION AND KNOWLEDGE EXPLOSION

Information revolution comprises the tremendous technological advances made during the past few centuries in human capabilities to encord, record and disseminate information. The electronic computer, together with its peripheral equipment, provides electromechanical capability for modifying and processing stored information to produce vast new stores of information. Information revolution produced a knowledge explosion, whereas before the information revolution and knowledge explosion, a scientist, researcher and administrator could easily keep track of developments in their own fields, it is no longer possible now. It is for this reason that libraries, information and documentation services came into existence. It would have been a very costly affair in terms of time and money if every administrator, researcher etc., in an organisation were to be responsible for collecting and going through all publications and documents in their own fields. In fact throughout the whole year they would not even scratch the ground let alone to sit down and then think of their problems or analyse the information.

INFORMATION AND DOCUMENTATION SERVICES IN ZIMBABWE

In Zimbabwe there is not as yet a highly developed and well financed information and documentation service when compared with the developed countries. As a developing country we have a few information and documentation services which I will try to describe.

UNIVERSITY OF ZIMBABWE LIBRARY

The biggest well staffed and financed library in Zimbabwe is the University of Zimbabwe Library. This institution consists of the main library and four branch libraries which include the Medical Library, the Law Library, the Education Resources Collection and the Map Library. The total collection of the University Library system is 302 000 volumes. In addition the University Library receives 3 605 current periodicals of which 461 are government publications. The University Library's annual budget is well over $ 700 000 per annum.

I should point out that the main function of the University Library is to support the research, teaching and learning activities of the University. But its information and bibliographic reference services also support research in the country as a whole. To support this, for example, the University Library was the first one to compile a comprehensive list of periodicals in Zimbabwe libraries. It is also the first to compile the Current Research Index. Both these functions have now moved to the Scientific Liaison Office which is in the Prime Minister's Office.

Up to February 1980, the University Library used to offer a current awareness service to a number of Government scientific and technical libraries but unfortunately this was discontinued because of staffing problems. I sincerely hope that the University Fathers will see it necessary and adequately staff the library so that it can continue to offer this very vital information service to Government Departments which carry out research that is important for the development of the country.

The University Library is connected to external information and documentation services by means of a telex. The library also has an advanced reprographic service. It is able to photocopy, microfilm/fiche and make slides.

No information and documentation activities of the library are as yet computerised but some members of the University library are actively studying how the computer technology can be used in the library.

NATIONAL FREE LIBRARY OF ZIMBABWE

The National Free Library of Zimbabwe was established by an Act of Parliament to:

1) Promote the widespread of reading in Zimbabwe of books of a cultural, educational and scientific character by providing facilities for the free lending of such books and of reading, research and study and to maintain and develop services connected therewith.

2) Serve as the national centre for interlibrary loans and services.

The National Free Library is the second biggest library after the University. It has a book stock of over 70 000 documents. There is not a truly national library service in Zimbabwe as yet covering the whole country. The National Free Library is not supported by branch libraries in the urban and rural centres. It however, tries to off-set this major disadvantage by a postal system which can, theoretically, send books to all the remote corners of the country. In the year ended June 1980, 18 764 postal loans were made. It is hoped that, with the recent Alison report on Libraries and the President's speech opening Parliament, a national library service has now become one of the Government's priorities. Whatever course the development of the national library service will take, the National Free Library is poised to make an important contribution. If the Greenfield and Alison reports are implemented by Government, the National Free Library will become the Matabeleland Regional Headquarters. In the fields of science and technology we find that the issues of material on these subjects has increased from about 34% in 1969 to about 40% of the total issues in 1978.

GOVERNMENT LIBRARY SERVICE

The Government Library Service comprises all the Ministerial and Departmental Libraries throughout Government. It now has a total staff of over 120 including professional, sub-professional and non-professional staff. The joint annual allocation for purchase of books and periodicals is almost half a million dollars. Government libraries are found in all technical, professional and research departments and their main purpose is to support the research, technical and professional activities of their respective departments. Planners and decision makers in Government make their plans and decisions which affect the nation as a whole. It is therefore imperative that whatever plans or decisions they make are based on objective facts and data.

There are over 90 departmental libraries within the Government Library Service. Rather than mention each and every library, I shall just mention a few of the more important libraries.

CENTRAL LIBRARY, MINISTRY OF AGRICULTURE

By virtue of the importance of the question of food supply in Zimbabwe and indeed in all other countries, we in Government Library Service view the Central Library as one of the most important libraries. This library services all personnel of the Ministry of Agriculture. Because of the size and the specialisations within agriculture, there are also specialised Departmental Libraries like the Veterinary Library, Research and Specialist Services Information Services, Chemistry and Soil Science Research Institute, etc.

The Central Library provides a current awareness service to keep the officers in touch with developments in their fields. Current journals are circulated to officers whose interests they cover. An accessions list of recent acquisitions is also produced to keep patrons informed about new material acquired by the library. Material not available in the library stock is acquired through interlibrary loans and photocopies of journal articles can be acquired on behalf of library patrons.

The activities I have just outlined above are also carried out by the majority of Government libraries. I am therefore not going to discuss them any further.

One big shortcoming of our Central Library is that it is not yet a participant of AGRIS (Agricultural Information System). This has been mainly because of shortage of personnel. It is, however, already receiving some of the AGRIS publications. When Zimbabwe becomes a member of AGRIS it will input to the Central AGRIS data bank all information on agriculture and related subject fields originating from Zimbabwe and in return Zimbabwe will have access to agricultural information from other countries. The advantage of this information cannot be over emphasized. At the recent SADCC heads of Government Conference the need for a regional data bank to allow storage and quick retrieval of basic agricultural information was one of those areas listed for study.

PRIVATE SECTOR INFORMATION AND DOCUMENTATION SERVICES

Many major companies and statutory bodies have their own libraries and documentation centres. In this I include companies like Anglo-American Corporation, Lonrho, Delta, Air Zimbabwe, to mention just a few. A common unhappy feature, in most of these companies, is that none of them have as yet found it necessary to employ qualified librarians and/or information officers.

Information centres of major significance to the country as a whole include the Confederation of Zimbabwe Industries, the Associated Chambers of Commerce of Zimbabwe and the Small Industries Advisory Service. I will attempt to give a brief outline of the services given by these private sector institutions.

SMALL INDUSTRIES ADVISORY SERVICE

The Small Industries Advisory Service was set up to provide a technical information service to manufacturing industries through contacts with suitable information service both within and without Zimbabwe. It also acts as an agent for CSIR current awareness service for production engineers.

The Small Industries Advisory Service has information on all the industrial services available throughout the country and can advise prospective small industrialists about the best areas where to set up business as well as those businesses which are needed in these areas.

ASSOCIATED CHAMBERS OF COMMERCE OF ZIMBABWE

The Associated Chambers of Commerce of Zimbabwe provide an excellent information service to its members through the following ways:

1) Every month it publishes the ACCOZ Trade and Information bulletin. In this bulletin it includes Gazette news which concern the commercial field. In addition to this it disseminates information from the Ministry of Trade and Commerce concerning trade agreements, trade opportunities with other countries and official trade delegations.

   The ACCOZ Trade and Information Bulletin also disseminates information on trade opportunities. This includes information on services offered, agencies required, goods required from Zimbabwe and goods offered to Zimbabwe. There is also information on Trade Fairs and Exhibitions; forthcoming seminars and courses and publications of interest to the commercial community. The ACCOZ bulletin is a very informative publication which is sent to all members free of charge. It provides a very useful communication medium for businessmen not only in Zimbabwe but the world over.

2) Every day ACCOZ publishes its ACCOZ Commercial Exchange Daily Tender Bulletin which provides an excellent information source for businessmen on who wants what. All the major companies, Government, Municipalities etc. advertise their tenders through this publication. Members pay $50 per annum in order to receive the ACCOZ Commercial Exchange whereas non-members pay $60 per annum. ACCOZ also provides a useful photocopying and duplicating service. It publishes its annual Chambers of Commerce Directory which besides listing its members and addresses, groups them according to their field of operation. The Directory also provides useful information on Banking and Finance, and all relevant information for a person wanting to set up business in Zimbabwe. There is a Trade and Reference Library at ACCOZ Offices. ACCOZ also publishes a monthly journal entitled Commerce. There is not, however, a qualified librarian in the ACCOZ Library. Mr. Keith Nicholson, Chief Executive of ACCOZ is quoted in the Business Herald of 23 July 1981 as saying that trade among the African, Caribbean and Pacific countries is damaged by lack of trade information. As I will mention later on, there is need for ACCOZ and CZI to take a lead in establishing a comprehensive business library and information centre for the benefit of their members.

CONFEDERATION OF ZIMBABWE INDUSTRIES

The Confederation of Zimbabwe Industries (CZI) is a sister organisation to ACCOZ and as the name implies it is concerned with industrial concerns although companies providing a service to industry can join as associate members.

CZI disseminates up-to-date information to its members by means of monthly issues of its own magazine , the "Industrial review", and the CZI Daily, Weekly, Monthly Information-Trade enquiries-news-events. In addition CZI publishes the annual CZI register and Buyer's Guide.

1) The CZI Register and Buyer's Guide

   This is published annually. It first of all lists manufacturers and Associate Members of CZI and their addresses. It then lists those manufacturers which can use the Standards Certification mark of the Standards Association of Central Africa on certain of their products. The next section lists the products including services by Associate members of CZI. The following section gives the brand and trade names and the companies which hold these trade names. The next section provides us with names of the Chief Executives of the CZI members. The last section gives us general information which any business man is interested in.

   The CZI Register and Buyer's Guide is a unique and very valuable publication. It however has its own shortfalls when it comes to the list of products and brand names. This is unfortunately not a comprehensive list of Zimbabwean products because it only lists products of CZI members. For a more comprehensive list of products of Zimbabwe the Ministry of Industry and Energy's list of Products of Zimbabwean Industries is much better for that information. All the other sections of the CZI Register and Buyer's Guide are unequalled by any other publication that I know of in terms of the information they provide.

2) The CZI Daily, Weekly, Monthly Information-Trade-Enquiries-News-Events gives up-to-date information to its members on current news items of interest to industrialists; visiting trade missions; conferences; seminars and symposiums; trade enquiries, etc.

Like ACCOZ, CZI does not employ a qualified librarian/information scientist. In Zimbabwe there is a singular lack of a comprehensive technical library to which Zimbabwean industrialists can turn to for a technical information. The Technical colleges and the University Library do stock technical literature but the scope and depth of this literature depends on the courses taught by these institutions. Time is now ripe for ACCOZ and CZI to start thinking of sponsoring a proper business library for the needs of our Zimbabwean businessmen. Such a library can widen the scope of possible business and manufacturing information available in Zimbabwe. The participation of Zimbabwe in the PADIS project will be to its own benefit. But as a first step to this participation Zimbabwe should have a well defined information policy and have its own National Information and Documentation Centre.

CENTRAL STATISTICS OFFICE AND OTHER GOVERNMENT DEPARTMENTS

The Central Statistics Office of the Ministry of Economic Planning and Development is the major Documentation Centre in Zimbabwe. It collects and disseminates socio-economic information of Zimbabwe. To a lesser extent each Ministry and Department also collects information relevant to its function but since UDI many Ministries and Departments stopped publishing annual reports and most of the data they collected was classified and therefore not accessible to many people. It is hoped that the independent Government of Zimbabwe will encourage its Ministries and Departments to make available to research workers, administors and planners all the non-security information they need.

CONCLUSION

To sum up, I can say in Zimbabwe, there is no clear distinction between a library and a documentation centre. What is important however, is not the name but the service offered. Our documentation and information services are still in its infancy but I hope that this seminar will go a long way to highlight the importance of services. We will have a lot to learn from our friends who have come from ECA - PADIS, ESAMI and the Botswana National Institute of Research. What is even more important is that I hope that this seminar gives an opportunity to our senior civil servants gathered here today to appreciate the importance of information in their day to day work. Information is an important resource for development to take place.

It would be a miss if I were to end up without saying something about the proposed National Information and Documentation Centre (NIDC). This is a subject of significant importance to Zimbabwe. This meeting will have ample time to discuss the pros and cons of accepting or rejecting the idea of the National Information and Documentation Centre. Some people may say it is too costly. Yes, it can be very costly if it can be thought of as an entirely new centre to be established in Zimbabwe. But such a decision will have been made without reference to the prevailing situation in the country. We already have institutions in Zimbabwe whose functions, as I have outlined above, is to collect, encord and disseminate information. These institutions are however limited in what they can do because of funds and to a certain extent personnel. Therefore when considering the question of setting up the National Information and Documentation Centre, I should like to suggest that we should not think of it as a completely new concept for Zimbabwe. We should rather centre our thoughts on which of the existing institutions is the most suitable home for the NIDC.

THE CONCEPT OF NATIONAL INFORMATION SYSTEM IN ZIMBABWE

S. R. Dube

Zimbabwe Government Library Service

NATIS (National Information Systems Programme) for developing national documentation, library and archives infrastructure is now a household concept in international documentation and information circles. But in Zimbabwe it is a new concept. It is new in the sense that although Zimbabwean information officers and documentalists have read about it and attended seminars/ conferences outside this country where it was discussed and have seen it in operation, this is the first time experts in this field have met in Zimbabwe to hold a seminar on this subject.

It is appropriate therefore to start by defining this concept. NATIS is a development strategy for a nations's information resources. It is a programme of action designed to improve information and documentation services, taking into consideration the economic and social structure of the country and its culture within the framework of over-all sectoral plans and communication infrastructure. In essence NATIS aims at maximizing the use of available information by ensuring that all engaged in scientific, educational, political, social or cultural activities receive the required information which can enable them to make optimum contribution to their respective sectors of society. NATIS also relates to all the agencies, resources, processes and activities involved in the transfer of information in a country.

In setting up NATIS in a country several agencies are involved. The government comes in as the initiator, designer and coordinator in formulating the policy. Quasi-governmental agencies which seek to promote efficient utilization of existing information facilities must also be involved. In addition, if NATIS is to be firmly established there must be interaction between documentation centres, libraries, archives, publishing and printing houses, professional societies, government information departments, research organizations, commercial and industrial organizsations, and any other institutions which generate, house, preserve and disseminate information to users.

It is important to note that NATIS is interdisciplinary in nature, national and international in applicability, and recognized the interdependence of all institutions which are concerned with transmission of ideas, knowledge and information. NATIS takes into consideration the economic, political and cultural level of countries. It is therefore flexible and can be implemented in phases. In seeking to integrate the planning and implementation of documentation, library and archives infrastructures, it will promote economical and efficient use of finance, physical plants and facilities, manpower and organizational know-how. Above all, NATIS, like other world information systems is an integral component of the much debated international economic and social order which is intended to improve the economic and social life of the Third World nations

by narrowing the gap between the rich and poor nations; and within countries by reducing the gap between the information 'rich' and the information 'poor'. The main objective of it all is that possession of relevant information will result in acquisition of knowledge necessary for economic growth.

Historically, the concept of NATIS was conceived initially at regional conferences which culminated in the UNESCO sponsored Intergovernmental Conference held in Paris in 1974. The most fundamental recommendation of this was the acceptance of the general concept of national infrastructures of documentation, library and archives services. The concept is outlined in the document: National Information Systems (NATIS): Objectives for National and International Action[1], in the form amended by the conference, as an overall structure encompassing the various services involved in the provision of information for different sectors of society and categories of users.

The Recommendation invited member states of UNESCO to take suitable action to create or improve an infrastructure for information services in accordance with the economic and social structure of a country and its cultural heritage, and within the framework of the national over-all and sectoral development plans and its communication policy.

The Conference also recommended, inter alia,

(1) that such a national system or infrastructure should be supported by the following pre-requisites: Appropriate legislation, finance and qualified manpower; by the use of modern information technology; and should be provided with appropriate national co-ordination of the various components of the system;

(2) to UNESCO, that within its available resources it should increase its assistance to developing countries to help member states achieve the objectives of their national information systems;

(3) to the Director General of UNESCO, that in consultation with member states, he establishes under the Aegis of UNESCO appropriate machinery to ensure that UNESCO activities are directed towards assisting the close articulation of national, regional and international activities;

(4) that there should be close co-operation between UNESCO and three international non-governmental organizations associated with the Conference, Viz: International Federation of Library Associations (I.F.L.A.), International Federation for Documentation (F.I.D.) and International Council on Archives (I.C.A.); and that this co-operation be extended to other relevant international non-governmental organizations. These include the International Organization for Standardization, the International Council on Reprography etc. and organizations representing users.

---

[1] Com 74/NATIS/3 Unesco Bulletin for Libraries Vol.25,No.1-Feb.1975

The Significance of NATIS in Zimbabwe

In the light of the definition given of NATIS and the recommendations made at the 1974 Intergovernmental Conference in Paris, it is now appropriate to look at the possibilities of its implementation in Zimbabwe. Mention has already been made of the recommendation made at the Conference to invite member states (of UNESCO) to take into consideration all elements of a national information system. In our local situation national development plans were put forward at the ZIMCORD (Zimbabwe Conference on Reconstruction and Development) held in March this year. But the development of the National information system was unfortunately not one of the components of many national plans presented.

Despite this omission it is essential that NATIS be included as a vital component in the development plans presently being considered by the Government. The following pre-requisites should therefore be taken note of in the planning stage:

First, a survey of existing resources physical, financial, institutional, technical, human, and the method of their allocation must be conducted. In this respect commissions of inquiry were appointed in the last 10 years into the Library Services of this country, and they made reports which could be used as basis for analysis of the existing resources. These were the Greenfield Commission which presented its comprehensive report in 1971, and recently W. Alison, Director of City of Glasgow Libraries was invited by the Ministry of Education and Culture to study the library services structure in this country and make recommendations on the future structure of the services. The report has now been presented to the Minister. These reports do not cover the whole field of the information and documentation services in this country. But they provide a basis for action. It is also necessary to point out that while the planning and establishment of the national information system programmes should be adequately prepared, it would be wrong to delay its implementation for rather too long because of the unavailability of the background information which is evidently ideal to have.

Second, if full data is not readily available it is the best to go on forward on the basis of imperfect information and to correct any errors made in the light of experience and new ideas acquired. It is opportune to stress that valuable existing services and programmes, if any exist, should not be endangered. This would defy the pragmatic and realistic base of NATIS. In other words the whole process should entail adoption and adaptation.

Third, at all stages of planning user needs must be carefully assessed. User groups are often bodies which are influential in the national policy planning process and these should be natural allies in the pursuit of NATIS goals. Examples of such organizations and institutions are: Associated Chambers of Commerce of Zimbabwe (ACCOZ), Confederation of Zimbabwe Industries (CZI), Research Institutes, the University of Zimbabwe, Technical and other Academic Institutions, Research Organizations and Professional Societies.

Fourth, there is need to introduce nationally and internationally acceptable standards to assist in the organization of the machinery for transfer of documented information and the consequent reduction in the wasteful duplication of services in the country. In this respect the work of the International Organization for Standardization is of special relevance to advanced and traditional information systems.

Fifth: the utilization of appropriate and available technology must be seriously considered. This does not imply the use of expensive hardware and software but an accurate evaluation of the costs and expected benefits that a particular type of technology might bring. It might be better to survey the technology existing in the country. On the basis of the survey, the hardware and software which would be needed will therefore be recommended. Manpower training facilities for Zimbabwean personnel who will man the system will also have to be planned for as a priority matter. Surveys of the manpower requirements must be part of the survey of available resources. It is not necessary to overemphasize the fact that without trained manpower the system would not get off the ground.

Sixth, concurrently with the planning it will be necessary to introduce legislation and provide financial backing to ensure that the system will not collapse on account of inadequate support from the government and user groups.

Last, but by no means least, the introduction of a machinery which will evaluate at regular intervals the progress of the NATIS programme including the initiation of data collecting mechanisms, and the appropriate techniques for data analysis and forecasting. Continual evaluation is an indispensable technique for monitoring reactions from individual users and user groups who will be in a better position to give a feedback on the benefits they get from the services.

The Planning of NATIS in Zimbabwe

The pro-requisites stated above are merely guidelines. The objectives of the NATIS programme must be clearly spelt out, and the nature of the planning body must be defined. Articulation of the objectives must go far beyond the mere statement of overall guidelines, to include not only a declination of special problems and a certain ordering of priorities, but a quantification of the greatest possible detail of the norms and standards to be set for the plan period from both demand and supply viewpoints. It is important that the statement of objectives be made in the light of long-term prospective developments in the NATIS field in other countries. Making a long-term prognosis is difficult, however, because of accelerating technological and social changes (among other things) but particularly because of very rapid developments in information and communication systems themselves. This means, therefore, that serious studies of prospects must underline any statement of objectives.

The question remains as to where responsibility should lie for the definition of objectives and what should be the nature of the NATIS planning body. The definition of objectives should at least be done by specialists and parties closely concerned with the administration of NATIS who will be most familiar with current and future development needs. The analysis of future needs (to which the definition of objectives is largely related) is quite complex, and may require the setting up of a study group at least for the preparation of the first NATIS development plan.

It would appear, however, that in the longer term a permanent planning body for the development of NATIS should be established. In this regard the following suggestions are made:

- that a body responsible for the planning of NATIS should be created in this country and backed by legislation; that its membership should be fully representative of all bodies responsible for NATIS: major user groups, relevant professional bodies and all interested government ministries;
- that this planning body should be responsible to one ministry, which would act as its spokesman in the body politic and give it political support.

Wherever located, in terms of ministerial responsibility, the NATIS planning body will have the following functions:

(1) to prepare and cost a co-ordinated NATIS programme with the national development plans;

(2) to harmonise the allocation of resources for NATIS development, from both internal and external sources;

(3) to establish, and to provide for the regular review of national standards for efficient NATIS.

It is pertinent to note that it is almost an administrative corollary that responsibility for the control of the implementation of the NATIS plan should rest with the government ministry which includes the planning body. It should be remembered however, that viewed in its widest sense - that is, embracing the range of services envisaged in the concept of NATIS this plan embraces also machinery for the on-going co-ordination of information services of all governmental bodies. The planning department must accordingly be provided with finance and expertise required to carry out both its planning, control and general co-ordinating functions.

Finally, it is necessary to indicate the institutional components that constitute the basis of the proposed NATIS. That is to say, the institutions which should provide the information and documentation services. For comparative analysis and planning purposes it is necessary to categorise these institutions. This is required despite the fact that traditional distinctions between various categories of libraries may gradually diminish as an integrated national information system develops, that there is a certain overlap in the nature of service provided by the different libraries and their functions vary somewhat between countries.

Accordingly five categories of such institutions may be considered as generally acceptable for these purposes: their functions will also be summarized:

A. National Library

Functions:

(i) to serve as a permanent depository and service centre (e.g. for centralised technical services) for all publications issued in the country and to collect printed material concerning the country, wherever published, and frequently to act as the major resource centre for foreign literature.

(ii) to publish the national bibliography

(iii) to organize the national and international exchange of publications and information

(iv) to serve, if required, as the primary instrument for the achievement of coordinated library development.

B. University and College Libraries

This category includes institutions at the tertiary level of education. The prime function of University and College libraries is to contribute towards study programmes as well as the research programmes of these institutions. This, however, is not the exclusive function of the University. A University is generally supported by public funds and its libraries represent a substantial part of the total library resources of the nation. It is incumbent on the university library that these resources should be made available to everyone through an integrated national library system, and in many countries university libraries give a service to industry.

C. School Libraries

The basic purpose of a school library is to make books and other learning materials available to teachers and pupils in support of the teaching programme and to further the general intellectual development of a student, particularly by developing skills in the use of books and libraries. It must play an active part in the educational process, persuading staff and users of books guiding them in their reading and encouraging reading of a higher quality and fromation of the habit of reading for pleasure and self-education. It may also act on occasion as a public library, particularly in providing for all children in a community.

D. Special Libraries (or Documentation Centres)

These services exist to serve a specialised body of users within a definite subject field. Typically they exist to meet the needs of research workers and other specialists in government departments, research institutes, learned societies and industrial firms. The special libraries of a nation comprise an important part of the total national resources, not only of material, but also of skilled staff and documentation facilities, and should therefore be fully integrated into the nation's library and information system.

E. Public Libraries

Functions:

(i) To serve as a centre of culture (in its broadest sense, including recreation) and information in the community.

(ii) To provide services for all sections of the community, including children and disadvantaged readers, such as the disabled and sick, and also wherever necessary and possible to provide specialised information, including services to commerce and industry.

(iii) To encourage and promote the use of books and information

(iv) To provide appropriate materials and facilities to help to combat illiteracy.

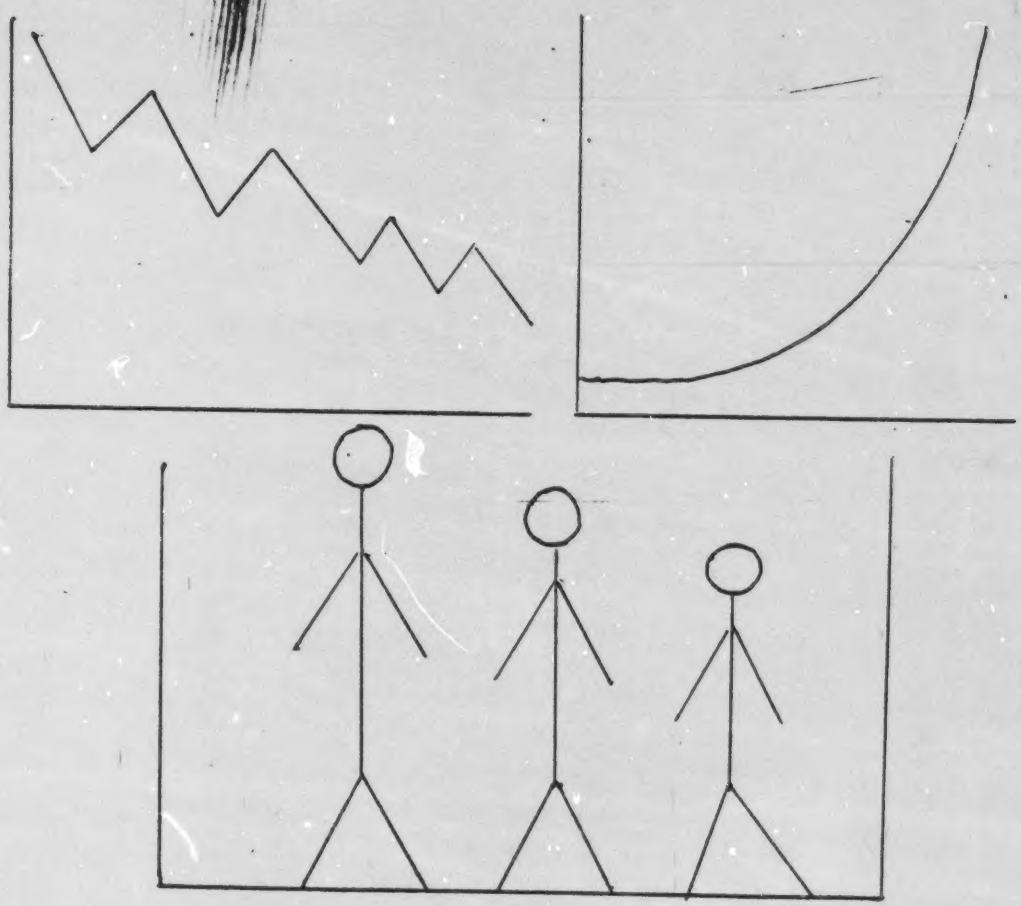
In summing up I would like to express the hope that I have managed to give a clear meaning of the concept of a national information system in Zimbabwe. NATIS programmes have been adopted in a number of countries in Africa but the implementation has varied from country to country. But in the then Rhodesia attempts to set up a national library and documentation service have always been marked by crass in difference on the part of the previous governments. At best a National Library Service was treated as a luxury which the country could not afford, at worst it was regarded as a sinister attempt to spread subversive literature to unsophisticated people. Zimbabwe now needs a national information policy to enable its people, researchers, industry and commerce to gain access to documented information from within the country and from outside. Information is a resource which is as valuable as other resources which are exploited in development projects. I would like to end this paper by quoting Dr. Brinberg, President of Aspen System Corporation who said at the fortieth Congress of the International Federation for Documentation; 'It has been written that in the beginning Good Lord created heaven and earth in six days. If so that was the first and last act of economic development to occur without the benefit of information.'

SOME NOTES ON THE USE OF DATA FOR PLANNING AND DECISION-MAKING

(G.M. MANDISHONA)

Director

Central Statistical Office



Some Notes on the Use of Data for Planning and Decision-making

"He who runs information runs the show". Joseph Goebbels

1. WHAT IS DATA?

   (i) Data = mass of undigested facts and figures collected from various sources.

   (ii) A data item = the smallest unit of data that has meaning to its users

   (iii) Hence, Information = morsels which have been extracted from the "mass of undigested facts and figures" (data) and processed for a specific person or persons, for a specific purpose.

   (iv) Statistical data is only an aspect of the generalized concept of data and strictly refers to numerical information, numerical facts or numerical estimates. We will emphasize on this aspect in the sequel.

   (v) Four major attributes of meaningful statistical data:

   Standardization (units)
   Comparability (in time, location) etc
   Classification (by area, size of herd (cattle), type of cattle
   Global organization (uniformization of concepts and techniques)

   (vi) Thus, statistical data = an organized mass of numerical data to be evaluated and analysed, and to assist planning and decision-making processes.

   UNDIGESTED FACTS ⟶ FORMS ⟶ DECISIONS

   (vii) Two divergent views of statistical data:

   (a) published data provide a degree of infallibility - for acceptance without question

   (b) statistics can be made to prove anything, and therefore by implication, they can prove nothing

   Statistics' supreme objective - to quantify the total resources - human, natural, capital.

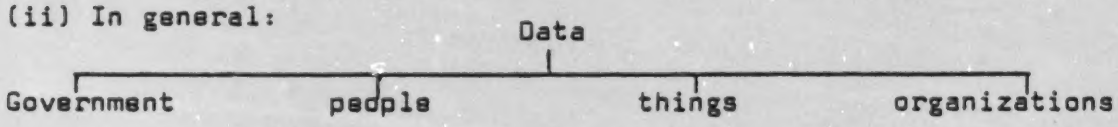
   (viii) Concept of data reduction - messages underlying collected data need to be "communicated": tables, lists, charts, graphs, numerical estimates, written language.

2. WHO NEEDS STATISTICAL DATA?

   (i) Individuals - prices in shops, performance of a new car, buying a new house.

   Government - policy formulation, understanding of economic and social relationships, implementing and monitoring a national strategy (ZIMCORD)

   (ii) In general:



(iii) For individual: identity, employment, education, taxation etc.

For Government: Central Statistics Office, say, publishes Digest of Statistics, Trade Statistics, Industrial Production, Balance of Payments, National Income, Census of Population, etc.

(The contention is not provable that many government decisions made in the past could have been improved upon had more use been made of statistical data).

(iv) For proper use information (statistical data) must be accurate, tailored to the needs of the user, relevant, timely, understandable, attractively presented, up-to-date, complete, regular.

3. THE NEED FOR ACCURATE STATISTICAL DATA

"Bloody instructions which, being taught, return to plague the inventor". Macbeth.

(i) Data
- informative
- reliability
- interfaces (who compiles them, who accesses them?)

(ii) Problems of data collection/dissemination in developing countries:

Coverage (transportation, accessibility, awareness, cost)
Incomplete Vital Registration systems
Lack of skilled survey personnel and adequate equipment
Lack of standardization - internal, external (e.g. Central Statistics Office, Reserve Bank, Treasury)

(iii) Our objective is to present accurate and the right statistics to the right people in the right way.

(iv) Quality rating: excellent, highly technical, contains nothing new, badly written, contains new ideas.

(v) Question: "What can we do about the "hard-to-catch-nature" of accurate statistics?"

4. HOW DO WE OBTAIN OR ACCESS DATA?

(i) Data collection
- ad hoc measurement
- ad hoc questions
- surveys
- censuses

(ii) Because the universe is both costly and time-consuming to enumerate we normally collect data from a SAMPLE (true representative of the universe). Sampling theory, survey design, questionnaire design, method of data collection, field operations, data processing, analysis and report publication. Statistical tests used to measure the significance of the results.

Central Statistics Office: household surveys, censuses of population, industrial production, employment, etc.

(iii) Thus, surveys and questionnaires now the principal means of obtaining data. Essentially we view all our statistics as estimates (of the true universe value), the nearer an estimate approaches the true answer the better the statistics. Depends on method of data collection, source of data, methodology used.

(iv) Government statistics: close collaboration between Central Statistical Office, Treasury, Reserve Bank, Ministry of Economic Planning and Development.

5. INTERPRETING STATISTICAL DATA

Statistical data only a tool to be used in conjunction with other decision-making processes.

(i) Not sufficient to know what's happening - but where and how are things happening? Suppose industrial production is declining:

(a) Is the fall due to consumers spending less? To falling exports? To rising imports or to decline in capital spending?

(b) What is happening to stocks; to prices and employment?

(ii) Data have trend patterns: time series, e.g. commodity sales have long-term trends, seasonal patterns or irregular effects. To make conclusions about long-term trends eliminate trend effects, e.g. seasonal adjustment, standardization by age, sex, location, income, etc.

(iii) Consider two shoe-manufacturing salesmen surveying a market:

A: "Splended market for boots - nobody wears any!"

B: "No market for boots - nobody wears any!"

Statistical data only ONE piece of information to be combined with other decision-making devices.

(iv) Consider crime data: There is a decline in the number of teenage offenders:

(a) Can we say that crime is receding?

(b) Data may reflect improvements in police preventive methods.

(c) Less convictions may have been made because police were negligent (contradicts (b)).

(d) If teenage crime is on the decline - is it because the nation had entered a moral improvement, or that the teenagers now represent a smaller proportion of the population? All these aspects must be explored.

(v) The British Medical Association published results from a survey of illness among railway clerks:

	days absent
Chief clerks	2 - 4
Senior clerks	7 - 12
Ordinary clerks	11 - 15

(a) Can we say that promotion to senior ranks defeats illness?

(b) Can we say that more responsible individuals will take less time off from work?

(c) Once promoted, the more senior staff cannot afford to be "ill" too often?

(d) Can "days absent" prove anything as to the degree of severity of illness suffered?

6. DATA/INFORMATION AND THE NEW TECHNOLOGY

"The letter killeth but the spirit giveth life". 2 Cor. III, 6.

(i) Modern technology and man-machine society creating new values: power, efficiency, maximization, total control, etc.

(ii) Operations Research and Systems Analysis:

e.g. Critical Path Analysis (CPM) - a method for planning and scheduling large complicated undertakings (dam construction, population census, etc.). The project is represented as a network with durations and a set of precedence relations. CP = path containing those activities which must be completed in their given duration if the minimum completion time is to be achieved. CPM = to meet project time at minimum cost.

A PERT-type system is designed to aid in planning and control so that specific objectives may be met, e.g. meeting specified deadlines, scheduling hazards and bottlenecks, etc.

Other aspects are mathematical programming and system analysis.

(iii) Statistical forecasting - a prediction method based on past experience and a mathematical model. May be grouped under four headings:

(a) extrapolation of trends - projecting trend curve forward in time,

(b) morphological analysis - classifying a set of processes according to some feature. From this grouping it is possible to recognize a missing member and to set about constructing such a member. Method used in metallurgy and transport system analysis.

(c) heuristic reasoning - application of a rule which is plausible but which cannot justify a prediction. The prediction is made on an analogy (danger!). We enact "scenarios" for various possible situations (intuitive projections),

(d) modelling - physical models (engineering), mathematical models, computer models (simulations).

(iv) Computer technology - advent of massive statistical data banks in industrialized countries.

(a) Data base management (DBM) - a data base is a collection of interrelated data designed conveniently for different users. The same data items are used in multiple records and documents:

e.g.

DATA BASES	ORGANIZATIONS		
	Commerce	Education	Transport...
Financial	-		-
Natural Resources	-	-	-
Personnel	-	-	
Property			-
Students	-	-	
....			

Data bases may be shared by multiple processes and organizational groups (non-redundancy).

Data item may be customer number or invoice number - these may be used for various records and documents, e.g. customer file, shipment report, overdue accounts, etc.

"Who sees variety and not the unity, wanders from death to death" Katha Upanished.

(b) Management Information Systems (MIS) -

Routine operations (costing, payroll, inventory control, ...) Management operations (planning budgets and capital, choosing suppliers, production, scheduling,...) Strategic planning and decision-making (long-range forecasting, financial and personnel policies, determination of markets,...).

(c) <u>The issue of data banks and data bases</u>:

(i) Can statistical data wholly summarize human behavior or personalities.

(ii) Can we therefore build a data systems model for influencing nature?

(iii) Are data banks socially justifiable? (democratization: who owns them? who accesses them?).

(iv) Should information collected for one purpose (say, by a Government Department), necessarily be made available for other purposes?

(v) Do data banks make provisions for redemption?

Ethical problems -

(a) Incorrect records - by accident or by sinister design,

(b) fear of a diminution of freedom of action, personal or collective, by systems too closely tied to a rigid statistical logic,

(c) misuse of the new power which will derive from the extence of data banks/bases.

"The Gods did not reveal, from the beginning,
All things to us, but in the course of time,
Through seeking we may learn and know things better".

Xenophanes.

ROLE OF INFORMATION IN DECISION MAKING

by Mr. A. Musana (ESAMI)

Introduction

Traditionally, in most African countries the pattern of decision making was characterized by loyalty to a chief or group of elderly and wise men. If the decision concerned community it was at a gathering of men who had to be unamimous or efficacy of the seniors (1) but complexity recessitates a men approach to decision making in our situation. (2) To-day decision maker, at whatever level, whether in public or private sector, is operating in a complex environment, one that is composed of multiple causes and effects. He is working under factors some of which are within some sort of control, others beyond his control. He is operating within the dynamics of multiple, sometimes opposing interests: his own personal values; the personal values of each one of the individuals affected by a decision he takes; organizational values and finally external environmental values. It might cause resistance, apathy, or total indifference. He is faced with a multitude of solutions, and in the absence of absolutes the solution he considers best may be worst to another. Furthermore, as he decides and implements certain strategies the very environment in which he is operating is changing constantly. A time lag between selection of a particular course of action and its implementation might result into another perhaps more complex problem, thus leading to wasting of the organizsation's resources.

In effect, the manager is operating in an environment of considerable uncertainty.

Yet the manager must be capable of defending his decisions and do so very effectively. He cannot do this if his decision is based more on desire or wishful thinking. He, therefore, requires as perfect information as possible at each phase in the decision

making process to enable him to finally select, out of so many alternative courses of action, one that will yield the greatest return for least commitment of the organization's resources. In order to be able to get such information he requires an efficient intelligence or information system.

Information

Until recently information was generally not regarded as a fundamental production factor. It appeared, so the argument went, to defy laws of scarcity since it did not diminish through use. It also resembled a free good. It is, however, now a recognized factor that, through it does not follow laws of conservation of energy, information gets used up through either obsolescence or loss of novelty (3). Information is now considered along side human, material and energy resources an essential input in the social and economic development. As D. Lamberton put it, "in a world...where the firm is obliged to make unique and crucial decisions to optimize and innovate, the making of such decisions puts a premium on information: its acquisition, storage and utilization become a major business activity"(4). From the systems point of view information holds together the various subsystems or system's components within the organization. It is a fundamental resource, the "life blood of organization helping to sustain the stability of the organization"(5). Effort is now being directed towards better management of information, an essential resource unlike before when most effort in organizations was being spent on management of tangible resources: finance; capital equipment; personnel and materials (6).

What is Information?

There have been several attempts to find definition of information, many a time in vain. Among some people information has been understood to mean data. Some others have understood it as knowledge, facts or opinions. According to Davis "information is data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current or prospective decisions" (7). Data then is raw material, a string of symbols, to be processed into information.

As illustrated in Fig. 1 information reduces uncertainty. As information about a problem decreases the uncertainty about it the problem tends to decrease. Weaver and Shannon who have done considerable work in the field of information theory assert that "the (amount of) information I obtain when you say to me corresponds to the amount of uncertainty I had previous to your speaking, of what you were going to say. If I was certain of what you were going to say, I obtained no information from your saying it" (8). Further, given that were an organization such as a business to be left on its own it would develop an entropic state. According to a research carried out by the Medical Research Council (British) it has been found that information incentive will almost always increase output. It is probable that many experiments previously made to show how reward incentives increase output have, in fact, increased output because the information incentive was also operating. But an injection of information gives it active life. Using the input - output model below let us try to illustrate the role played by information in reducing uncertainty. A Form VI leaver qualifies for and wants to enter university. He does not know which university to go to (COMPLETE UNCERTAINTY). He goes to the library; Or placement officer; or writes to various universities to obtain DATA which, on arrival, he processes. After several combinations he decides on one (REDUCED UNCERTAINTY).

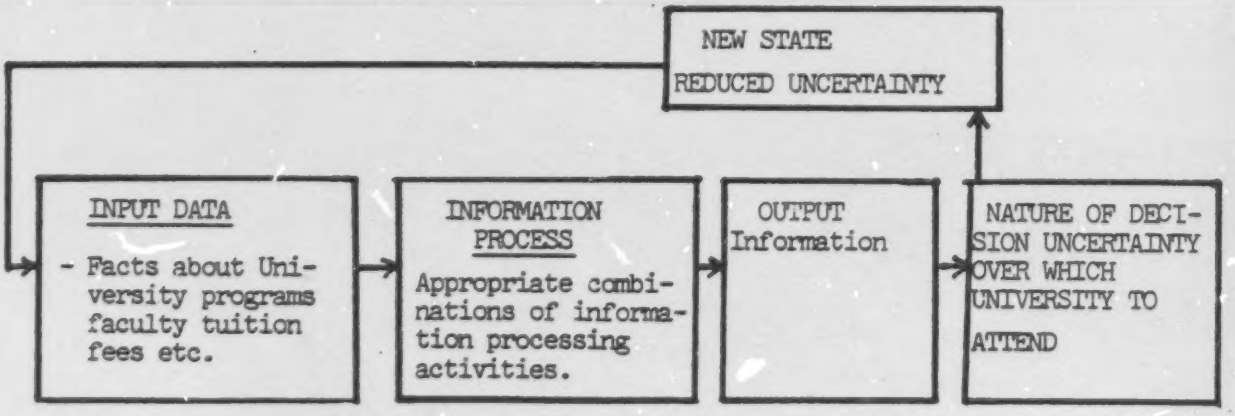

NEW STATE
REDUCED UNCERTAINTY
INPUT DATA
- Facts about University programs faculty tuition fees etc.
INFORMATION PROCESS
Appropriate combinations of information processing activities.
OUTPUT Information
NATURE OF DECISION UNCERTAINTY OVER WHICH UNIVERSITY TO ATTEND

Fig. I: Information reduces Uncertainty

Manager's Role in Information Processing and Decision Making

As illustrated in Fig. 2 a manager while carrying out his day to day managerial tasks he is involved in -

Monitoring

He acts as a monitor of information originating from both within and without the organization. He designs ways and means of collecting information: reading reports and other documentation; observation and interviewing. He monitors and evaluates them to ensure that variance between established standards and actual performance is not too wide.

Information Dissemination

He disseminates the relevant information to the various subordinates within the organization. He must be capable of deciding on which information should be transmitted to the subordinates.

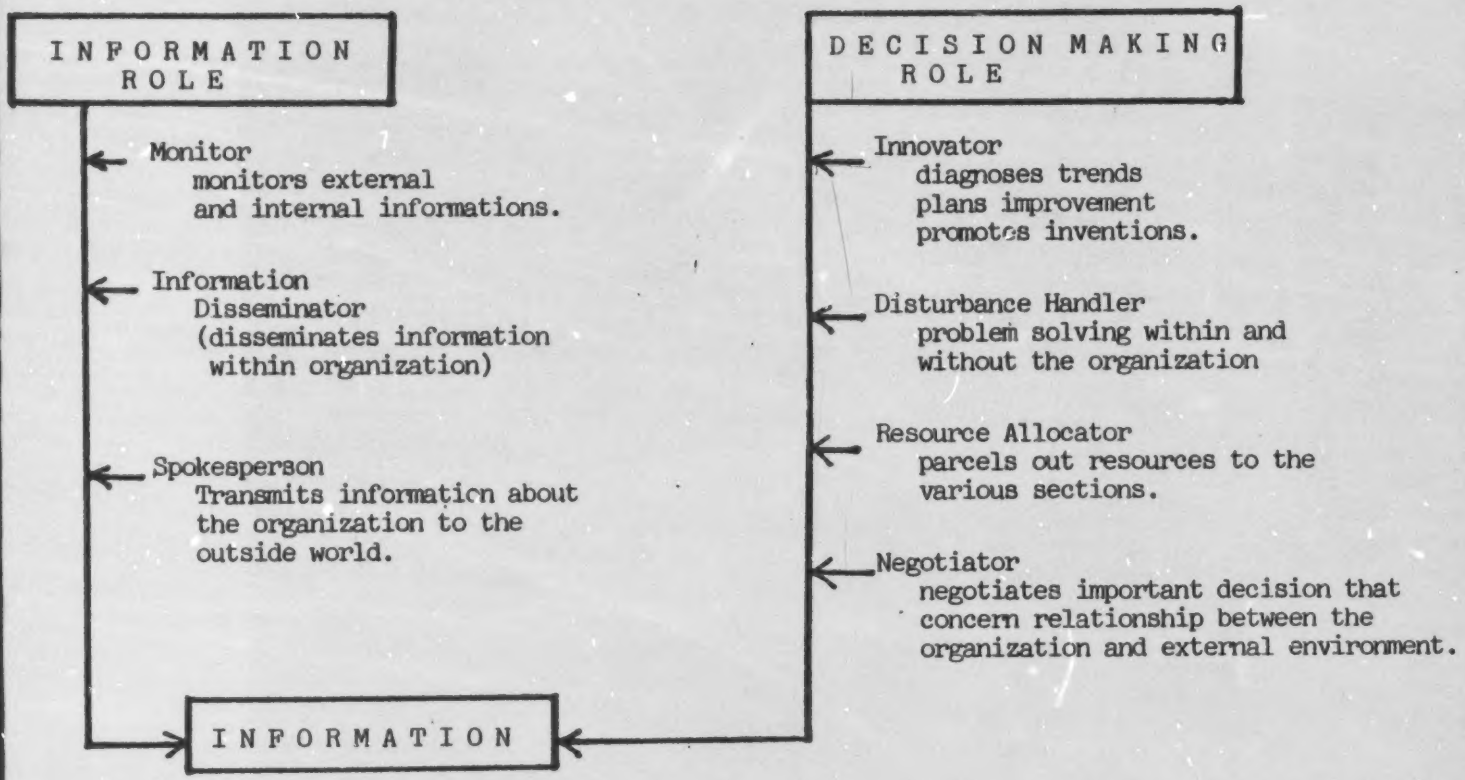


Fig. 2: The Manager as an information processor and decision maker.

Spokesman

He transmite information about the organization to the outside world. As a decision maker the manager is involving in

Innovation

He carries out a diagnosis of trends; plans improvements and promotes inventions.

Disturbance Handling

The manager is involved in problem solving. These problems may be pertaining to the organization both internally and externally. The task necessitates possession of specific data he can get hold of immediately.

Resource Allocation

The manager parcels out resources to the various sections depending on requirements and what is available.

Negotiation

The manager acts as a negotiator for important decision that may be involving relationship between his organization and the external environment.

So as can be seen the manager utilises information while at the same time generating more as he goes about his day to day managerial tasks. Information processing and decision making go hand in hand.

DECISION MAKING PROCESS

Considerable work has been done to conceptualize the process of decision making. Elements uncertainty, experimental or judgemental influence etc. have not made it easy. It is generally agreed that the process can be broken down into two sub-processes: the Formulation Phase and the Searching Phase (9). In detail, using Simon's Model there are three basic but interactive phases viz.

1. Intelligence Phase

   This consists of perceiving and becoming aware that a problem does exist. The manager searches both the internal environment for solutions, taking into consideration the social, economic and behavioral dynamics involved; the problems

relationship with the organizational objectives; constraining factors such as those beyond the control of the organization, etc. At this stage the manager ought to thoroughly separate the problem from its symptoms, given that perhaps what is being perceived as a problem is only a symptom of a much bigger problem. This phase is also referred to as the Problem or Opportunity Recognition. As has been stated elsewhere a problem well defined is a problem half-solved (10). This phase triggers the intelligence or information system (see Fig. 3). Adequate and accurate data is gathered from within and without the organization. The information shcuild be adequate because an overload or underload might affect the quality of the decision. The data should be transmitted timely given that however perfect the information may be, if it is transmitted too late, it is useless for the particular problem solution. It should be formatted in a manner, depending on the user level, that will make it readable. The top manager does not have the time to waddle though a whole load, of sometimes unnecessary, chaff. And if, without justification, he continues with analysis of the problem and search for solutions too long, the benefits will continue to diminish with times (the principle of diminishing returns).

In a nutshell, this phase involves, besides Problem or Opportunity Recognition, Analysis of the problem to ensure as few constraints as possible; the Generation; Processing; Display and Interpretation of the data which would assist in answering questions concerning constraining factors such as timing; available resources and, in general, the environment.

2. Design Phase

During the Intelligence Phase more ideas are generated. Those peripherally related to the problem or regarded as alternative hypotheses are identified and studied in terms of their possible consequences within known or potential critical factors. It is generally here that possible actions to be taken are devised.

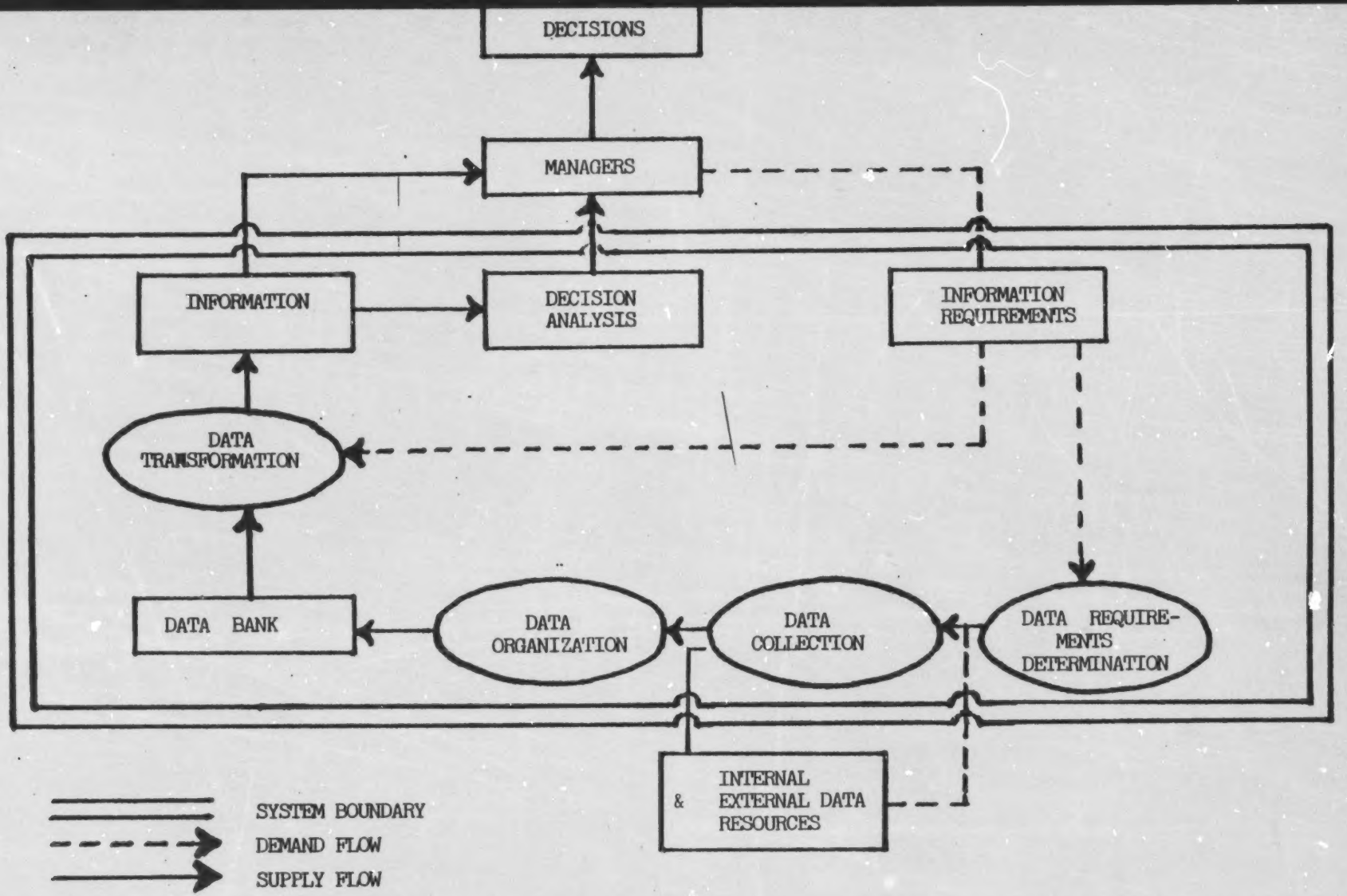


Fig. 3 Problem triggers need for Information

Adapted from Journal of Systems Management January, 1980

3. Choice or Selection of Optimum Course of Action

Decision making is a matter of compromise. It implies foregoing other alternative courses of action. Given that decision making has a time element, besides the behavioral aspect, a course of action chosen among many should be implemented immediately.

The three phases are illustrated in Fig. 4 below.

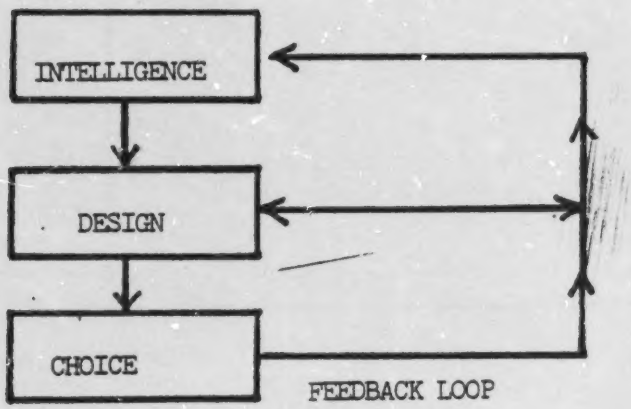


Fig. 4: Decision making Process

The model provides for performance review (feedback loop) to enable the manager to keep monitoring progress of each strategy he has implemented. This will further enable him to determine and take corrective measures.

During each one of the phases information is required and more data is generated for application during any of the other phases in the continuum. The information supplied or requested for does not necessarily have to bear the same characteristics. It is dependent on the level in the management continuum.

The foregoing is based on the assumption that there exists a machinery for the generation, processing storage; display and transmital of the information to the decision centres requiring it; such machinery is what is regarded as the information system.

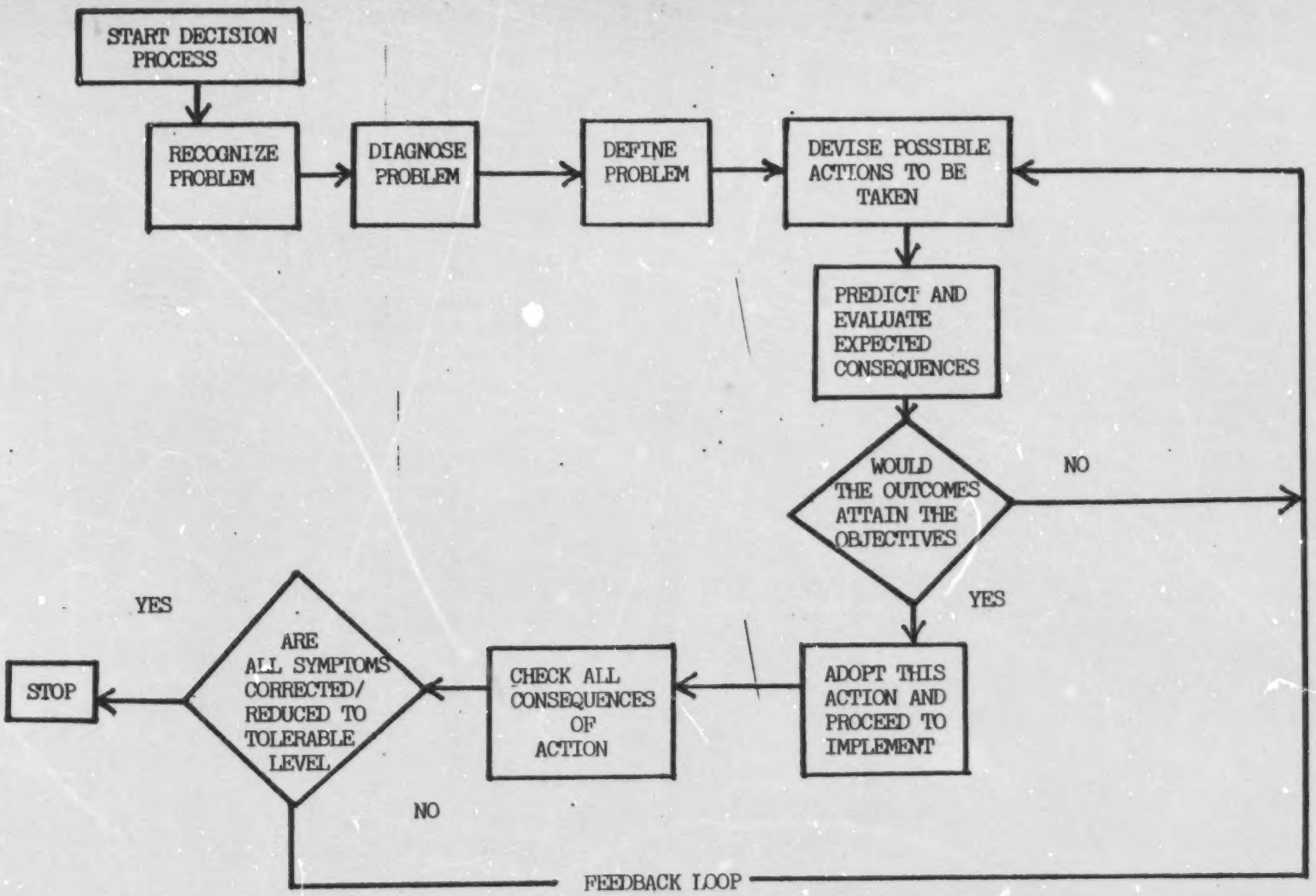


Fig. 5: Flowchart illustrating decision making process.

TYPES OF DECISIONS AND INFORMATION REQUIREMENTS

There are basically three types of decisions made in any organization. They are concerned with different activities, and as such they will require different types of information. In other words types of decision determines information requirement. However, having mentioned this, it is generally agreed that information to be of any use must be

: CORRELATED
: CONSISTENT
: CURRENT
: COMPLETE
: CONCISE

1. STRATEGIC PLANNING

This is concerned with long range plans and policies. It is not easy to apply predetermined decision rules. It consists of

: determination of the corporate objectives and philosophy and making changes where called for

: allocation of resources for achieving the objectives

: hypothesizing into the future about what could happen.

The type of information required for this type of decision tends to be externally generated given that this level of management is concerned with relationship between the organization and the environment in which it is operating. It tends to be more abstract; flexible and wide based; aggregated; not necessarily very accurate, and in summarized form. It could be a government report on energy resources future policy transmitted to the top management of an organization for study and action. It is predictive.

2. THE MANAGERIAL CONTROL (Tactical)

The Managerial Control level interfaces with both the Strategic Planning and Operational Control Levels. It tends to deal with the more concrete or tangible aspects.

The type of decisions made here involve -

: analysis of the strategic plans in logical divisions and effecting them

: developing of budgets for execution of the strategic plans

: making-follow-up to check on performance.

The type of information for decisions made at this level tends to be narrow based. It is generated largely from within the organization from such sources as personnel and financial records. It tends to be more detailed and well defined and filtered although not as much as the Strategic Planning type. It is more accurate and current, and frequently used. It is basically intended for the initiation of action which is consistent with the Strategic Plans.

3. OPERATIONAL CONTROL (Technical)

This level is concerned with

: Controlling day to day tasks such as inventory control

: ensuring that the specific tasks are carried out more effectively and efficiently.

Like the Managerial Control level the information for this type of decision is generated from mainly the internal operations records; it is very highly structured and real-time. It is intended for immediate action.

To summarize this section, the higher one goes in the decision making process the more premium is placed on externally generated information and is more complex given that the decisions tend to focus more into the future. The decisions tend to be less amenable to predetermined decision rules.

Another way to consider type of decision is to look at it from the programmed and non-programmed decisions.

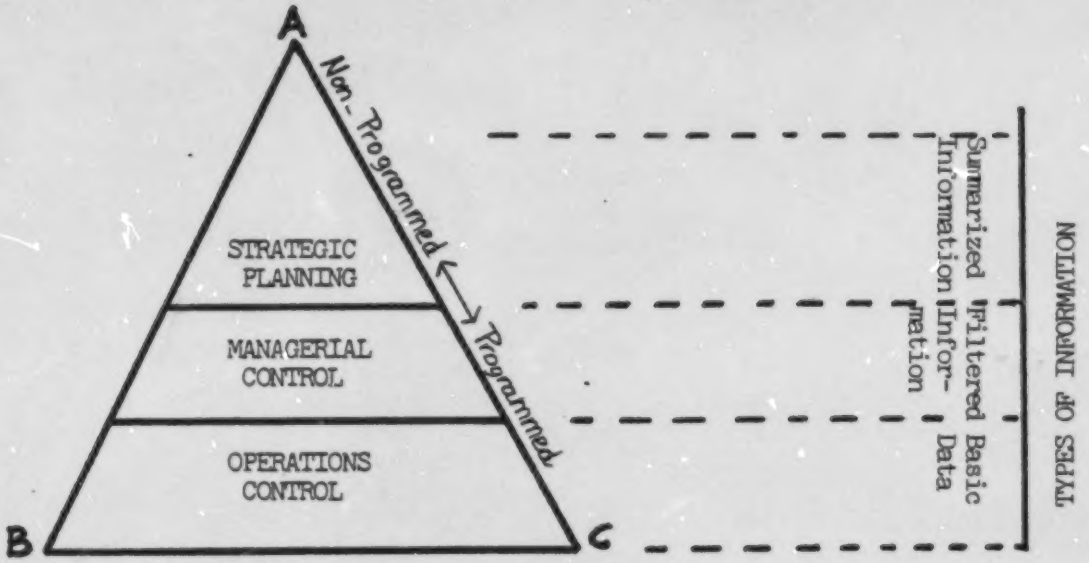


Fig. 6: Levels of Decisions and Types of Information.

Criteria for selection of information

What kind of information does a manager want? It has been said elsewhere that a manager presented with masses of data will tend to ignore most of it. It is therefore imperative that great care is taken to provide the right kind of information to the right manager at the right time. There are basically four aspects that must be considered viz. accuracy; timeliness; relevance and up-todateness or currency.

Besides, whereas at the Operation Level the manager (as see Fig. 6) would prefer Basic Data, at the Managerial Control Level the information required would have been Filtered. At the Strategic Planning level the Information is mainly is summarized form.

Design of an Information System

When I was invited to deliver this paper I understood my parameters as not including designing an information system. But suffice to mention a few basics in the design process.

There are basically four questions that anyone designing or changing an information system must grapple with viz. (11)

1. In what form should information be provided?
2. What Information should we provide?

3. To whom should it be given or made available?

4. What effects will formalising or changing the information system have on the existing set-up?

The last question is important since it has several implications, given that generally

: possession of information is a source of prestige and power. Some people appear knowledgeable if they reveal information, say in a meeting, that nobody else knew.

: as observation has indicated the more channels for information a senior manager has to him the better: status building. This of course is challengeable. Shouldn't the subordinate managers have more access to information than the senior managers?

: where automation is involved the human-to-human contact element in the communication process is reduced, if not removed. This could have serious effects on the morale of the workers. Besides, it reduces or removes tools like meetings which provide means for discussion and therefore act as check on the decision making process.

There are basically four major stages in the life of an information system (12).

1. INCEPTION

This indludes

Preliminary Survey

This is the stage when a need arises for either an information system or restructuring of the existing system for better processing of information.

Feasibility survey

This is also referred to as the gross or conceptual design. If the preliminary survey process indicates that indeed there is a need for the system this sub-stage is set in motion. Investigation is carried out in order to determine which designs are really feasible.

2. DESIGN

This includes

Specifications

What are the goals of the system?
How are they to be achieved?

Programming

Where computerization is involved the specifications are translated into a language understood by the computer.

Testing

Several tests are required to validate the programmes and design specifications.

Documentation

This is the stage when the system is very well documented. It greatly assists in future activities like training, re-design, etc. It is important that the design is flexible.

3. IMPLEMENTATION

Introduction of a new system creates changes in the organization. The users must be taught to work or operate the new system. Success or failure of the system depends a lot on this stage.

4. OPERATIONAL

When the system has been implemented and the shocks have been abated assumption can be safely made that the system has been accepted and can now operate normally.

In summation, Ladies and gentlemen, the decision maker is laden with a difficult task of making decisions that invariably affect man. He is working against several constraints the dynamics of which are multifarious. For instance, his value system and belief could easily be at variance with the needs and values of the society in general. Therefore for him to make coherent decisions he requires, besides disciplined approach; intellectual honesty

and timeliness, relevant, accurate and reliable information. This implies focusing attention on the identification and collection; processing; storage and transmission of data with a view to improving these activities. I would like to submit that if these activities are carried out well the decision maker is likely to, even with the uncertain environment in which he is operating, be provided with better intellectual capital, and even though the decisions he makes may not always be better but at least he should be in a better position to delineate in each case how much can be known and how much can be assumed: He will be in a better position to control the system; where intervention is called for he will do more timely and efficiently; the time lag between a problem and its eventual solution will be reduced.

From the point of development of our region, which by the way my organization, the Eastern and Southern African Management Institute is devoted to in assisting the members in improving performance improvement, the importance of accurate, reliable pertinent, timely is crucial. Professor Adedeji Adebayo early this year could not have emphasized it more when he said "Our poverty can only be sustained if we continued to fail to organize ourselves; - and, if we continue to make decisions without facts or based on incomplete information. The rapid diffusion of socioeconomic, technical and scientific information throughout a society and the internalization of the mechanism for collection, analysis and dissemination is one of the foundations on which socioeconomic, technical and scientific progress is based (13)". Earlier on Sir Robert Jackson had identified lack of information support as one of the problems limiting the capacity of the United Nations systems to effectively respond to the development needs of member states (14). Karithi characterized information as a precondition of nation-building. It provides a link between ideas and actions, between success and failure. The managers job is composed of choice between alternatives, some of which are conflicting options.

Given that these decisions affect man's welfare, it is imperative that adequate, accurate and relevant information is obtained on each alternative choice (15). In our attempt to improve or transform man's being we require a well designed plan encompassing the people's present values what resources exist now and what would be required in the foreseeable future based on exact data. Without such data our development strategy could end up being merely window dressing or esoteric.

REFERENCES

1. Nyerere, J.K. Freedom and Unity. pp. 103-105
2. Robertson, J.E. et al Problem Solving: a system approch Petrocelli 1978 p.3
3. Artandi, Susan Man, information and society: new patterns of interaction. Journal of the American Society for Information January 1979 pp. 15-19
4. Lamberton, D. Theory of profit. Kelley. 1965
5. VOICH, D. et al. Information systems for operations and management. South-Western Publishing Co. 1965.
6. HANSEN, J. and MCKELL, L.J. Decision-oriented frameworks for management information systems design in Information Processing Management: Libraries and information retrieval systems and communication networks: an international journal Vol. 13 no. 4 (1977) p. 215-225.
7. DAVIS, G.B. Management Information systems: conceptual foundations, structure and development. McGraw-Hill. 1974. p.32.
8. SHANNON, C.E. and WEAVER, W. Mathematical theory of Communication. Urbana: University of Illinois Press. 1949 p. 7
9. MURDICK, R.G. and ROSS J.E. Information systems for modern management 2nd ed. Prentice-Hall 1975.
10. -id- p. 322.
11. COLEMAN, Raymond J. and RILEY, J.J. MIS: Management dimensions. Holden - Day, Inc. 1973. p. 503.
12. LUCAS, Henry C. The Analysis, design and implementation of information systems. McGraw-Hill. 1976. pp. 44-45.
13. Professor Adebayo Adedeji at formal inauguration of the Pan African Documentation and Information System (PADIS) at ECA Addis Ababa, January 30, 1981
14. Jackson, Sir Robert G.A. A study of the capacity of the United Nations Development Strategy. Doc. DP/5 Geneva
15. Seminar on the Use of Documentation and Information for Planning and Decision making 24-28 November, 1975. Nairobi.

INFORMATION PROCESSING - COPING WITH THE USERS' NEEDS

By Francis Inganji - Research Fellow/Documentalist. NIR

Before I go into the details of this important subject, I should define what the terms "Information","Processing" mean.

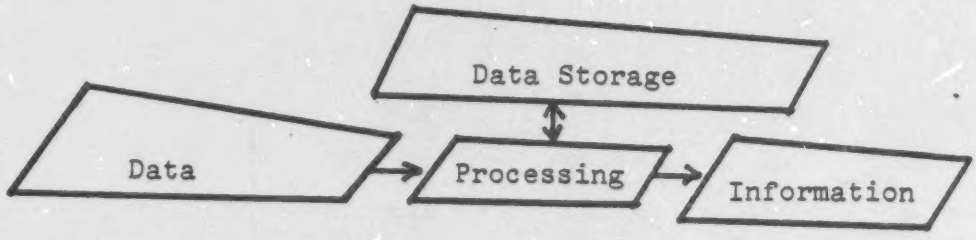
A. Information

Information is rather an imprecise term as commonly used. It can refer to raw data, organized data, the capacity of a communication channel etc. Underlying the use of the term "Information" in information systems are several ideas:

(a) Information adds to a representation, it has surprise value or it tells something the receiver did not know or would not predict.

(b) In a world of uncertainty, information reduces uncertainty. A useful general definition of Information for Information Systems purpose is the following:

"Information is data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current or prospective decisions". The relation of data to information is defined as that of raw material to finished product.



In other words the information processing system processes data in unusable form into usable data, ie information to the recipient.

The analogy of raw material to finished product illustrates the concept that information for one person may be raw data for another, just as the finished product from one manufacturing division may be the raw material for another division.
Note: that the relationship between data and information, makes these two words be used somewhat inter-changeable.

The value of information is related to decisions. If there were no choice or decisions, information would be unnecessary. The decisions can range from simple, repetitive, to long-range strategic ones.

Data: The raw material for information is defined as groups of non-random symbols which represent quantities, actions, things etc. Data is formed from characters. These may be alphabetic, numeric, or special symbols such as &, and $.
Data is organized for processing purposes into data structures, fine structures, and data bases. Data for one level of an organization may be information for another.

Information, in the information system sense may have several attributes.

(a) True or false. It may coincide with reality or not. If the receiver of false information believes it to be true, the effect is the same as if it were true.

(b) New. It may be completely new and fresh to the recipient.

(c) Incremental. It may update or add new increments to information already available.

(d) Corrective. It may be a correction of past false information.

(e) Confirmatory. It may confirm existing information. This is still valuable because it increases the recipients's perception of the correctness of the information.

Summary The terms "data" and "information" are often used interchangeably but there is a distinction in that, data is the raw material that is processed to provide information. Information is associated with decision making, and for this reason information can be considered as at a higher, more active level than data.

B. Processing

As we may have learnt from the definition of information ie information is data that has been processed into a from that is meaningful to the recipient, we therefore note that "information processing" is the process of "organizing and preparing documents containing information into a form that makes these documents easily accessible and retrievable". Examples of information processing are: indexing (classification), cataloguing, accessioning, abstracting, translating, and editing.

(1) Classification (conventional)

This is a process of dividing the whole field of knowledge into classes. We have several forms of classification schemes:

(i) Dewey Decimal Classification

Developed by Meivil Dewey, and first published in 1876. Many editions have been published since then. The whole field of knowledg has been divided into 10 classes, therefore "decimal" classification, classes again have been divided into 10 subdivision and so on.

eg. 000 - General works
100 - Philosophy
200 - Religion

-:

500 Pure Science
510 Mathematics etc.
511 - Arithmetic
512 - Algebra

(ii) Library of Congress Classification

This was not developed as an intellectual projection, but empirically and pragmatically out of an existing subject arrangement. It has alphanumerical notations (letters in the first two digits and then figures). The whole field of knowledge is divided into 21 general classes using the alphabet, a second letter denotes the general divisions of a class. Arab figures are used for smaller

sub-divisions. Example

A - General works. Polygraphy
B - Philosophy. Religion
C - Auxiliary sciences of history
D - Universal History
E-F American History
G - Anthropology
Q - Science
QA- Mathematics
QB- Astronomy etc.

(iii) The Universal Decimal Classification (UDC).

It was developed by two Belgians out of the Dewey Decimal Classification and has since been refined many times. UDC has become an international system with librarians of many countries participating in it. The headquarters of these efforts is the FID (Federation International de Documentation) in the Hague. UDC has been translated into many languages, and has not been developed primarily as a book classification, but as a means of indexing for all sorts of documents, particularly from the pure sciences and technology. UDC allows for correlation of class numbers by means of punctuation symbols. This gives the system an amount of flexibility, so that it can be used for indexing.

Example

669 - Metallurgy
669.1 - Ferrous Metals
669.2/.8 - Non Ferrous Metals
669.3/.6 - Non Precious, heavy industrial metals
669.3 - Copper
669.33 - Extraction from ore
669.34 - Refining
669.35 - Alloys etc.

(2) Indexing (Thesauri)

A thesaurus is a means of reducing the natural language with its abundance of possibilities of expression and description into a system language by means of terminological control (controlled vocabulary). This system language may comprise the whole field of knowledge or only parts of it. The essential feature of a thesaurus-compared e.g. with a dictionary, is that the thesaurus terms are not explained by defining sentences, but by term relationships. This means that any term of the system language is placed in a network of semantic, generic and associative relations, and these relations provide some kind of definition. Semantic control begins with the elimination of synonyms:

Vessel	Ship
non-descriptor	descriptor

One term in this case should be prefered, and this will be the Descriptor.

A thesaurus is a tool which is used in indexing. We have two kinds of indexing, pre-co-ordinate and post-coordinate indexing.

(a) Post-co-ordinate Indexing

This is when one indexes documents by terms denoting all the individual concepts present, but use a physical form that permits us to co-ordinate terms at the moment of searching. Forms that permit us to do this include the computer and the manual methods described in classification. This emphasizes the fact that co-ordination takes place after we have stored the encoded documents.

(b) Pre-Coordinate Indexing

Here the indexer co-ordinates the appropriate terms at the time of indexing.

(3) Abstracting

With the increasing importance of secondary services, particularly the abstracting periodicals, the "Abstract" of a scientific paper has acquired special significance. An Abstract has two main functions:

(a) It should satisfy the information needs of a busy reader and should enable him to decide whether the full paper is worth going through or not.

(b) It should be good enough to meet the requirements of abstracting journals.

(4) Translating

Up to the last three decades the vast majority of scientists wrote in Englisch, French or German, all of them fairly widely understood, now, however, a rapidly increasing proportion is in Russian, Japanese and Chinese. There are some publications in these latter languages, which contain very useful information, and therefore they have to be translated. Translation, therefore, forms part of information processing procedures.

Information Processing Vis-A-Vis Development

Introduction

In the last two decades, dramatic increases in the scope and volume of scientific research have occured, as may be illustrated by the fact that the amount of scientific literature is doubling approximately every ten years (Price 1963). For the scientist who needs to locate particular themes of scientific information, and the documentalist, who must make them readily available, the organization and management of this huge and expanding store of information is a serious problem.

The Information Explosion

The crisis in scientific information is the Problem of Growth. The recent rapid growth of scientific information is sometimes called the "information explosion", a term analogous to the "population explosion". The growth of this information is straining the traditional way of processing and handling information.

At present the volume of scientific papers already exceeding ten million is thought to be growing by about one million a year, though some would say nearer to two million. This gross figure includes some duplication of content, though study suggests that there is much less wasteful duplication than appears at first sight.

The major abstracting and indexing journals weed out a good deal of duplication and also of material that has only marginal interest for scientists. This problem of growth is complicated by four factors.

(a) Much of the new research is of a cross-disciplinary nature e.g. in bio-deterioration environmental pollution. This difficulty can be met by expanding or transforming the existing specialised information services, almost all of which are cross-disciplinary in scope.

(b) Language is the second complication. Up to the last three decades the vast majority of scientists wrote in English, French or German, all of them fairly widely understood. Now, however, a rapidly increasing proportion is in Russian, Japanese and Chinese.

(c) The third complication is the scattered nature of the growth in literature. Even conservative estimates put the number of current journals that are relevant to practising scientists at about 30.000. But the growth of reports and monographs has been at least as spectacular, as a result scientific literature is emanating from a vast number of varied sources.

(d) Fourth complication is that there is a continuing, perhaps even growing uneveness of quality. Most scientists readily admit that a good deal of the literature is not worth publishing. The number of useful journals is almost certainly much smaller than the grand total of 30.000. One study has suggested that in the USA for instance, important original research is possibly limited to about 400 journals.

(e) Finally, it is difficult to predict the scale and pattern of future growth.

Approaches to the Problem of Information Processing

Processing information on this scale is primarily a problem of organization of how to select from a large supply the small amount of information that each user e.g. a scientist or team requires, given that these requirements may cross the boundaries of disciplines and may extend beyond the language competence of the team and its supporting library.

One part of the problem providing physical access to literature itself is to be tackled systematically, e.g. in the U.K. by the creation of the National Lending Library for science and technology. Here information is properly processed, analysed and made ready to users. Access to translations should be much inforced by the cover-to-cover translations of important journals, by the creation of indexes to translations, by the improvement of translating facilities and by the development of skill with language as part of the training of information specialists. Another approach is to publish journals containing longer summaries, or letters, which include information on the purpose, methodology, and result of research, and leave out experimental detail which can be deposited centrally. It is clear that the primary journal with all its disadvantages is greatly valued by scientists and not easily replaced. For scientists, scientific literature outside the core journals is of little value and they can keep pace with these journals by either browsing through them or scanning contents pages reproduced in the Institute of Scientific Information, for example.

Needs for better means of Processing Information

There is an urgent need for better means of handling literature. Two main courses of action should be explored.

(1) The concept of an information analysis centre, should be extended and developed, in which literature of a narrow subject field should be carefully evaluated and only items of sufficient quality and relevance should be presented to users.

(2) Modern information technology, computers, telecommunications, microreprography etc., should be harnessed in order to select and reproduce items that are relevant, leaving users themselves to make any selection on the basis of quality.

Information and its Users

(a) The first characteristic to be noted about users is that the number of those who have need of information far exceeds those who actually use information. The first stage in communication policy implementation therefore is to create an awareness of information, its value, sources, accessibility and acquisition.

In general, the kind of information sources sought and used tend to be those easy of access and known personally to the user, regardless of the quality of the information. Information may be sought for a particular purpose in particular circumstances, or collected in advance because it is likely to be useful. It is of maximum use when it matches a need which is highly specific. For example, the need may be not just for "information about corrosion", but "information about corrosion at bimetallic joints exposed to a tropical marine environment; by midday tomorrow, not just anytime, a review of practice, not a treatise on electrochemistry; in English, and short enough to be read in an hour".

The working habits of the individual needing information, the importance placed on getting it, the facilities available for seeking it, the knowledge about these facilities, the judgement of their value, the estimate of the probability of getting what is wanted - all of these factors may affect information-seeking behaviour. Unless a person who wants information is fairly sure of getting it without much trouble, he is apt to do without it if it is not essential.

Relying on memory, skirting around the issue, or making do with incomplete or vague information from a colleague are not unusual behaviour traits. There is, however, a small group of users who actively seek information spending effort and resources to acquire pertinent information and these users infact are the most progressive in economic activity. For them, confidence in the credibility of an information service is a main condition for full use of it, secondly only to convenience factors such as accessibility and ease of use.

(b) From the user's point of view there is no distinction between scientific information and technical information. The results of a research programme on a particular catalytic reaction may be of as much immediate usefulness to a chemical engineer as a manufacturer's literature on plant equipment. The difference between users tend to be related to where they work in the chain of scientific discovery, technological innovation and adoption or diffusion of innovation. The following list illustrates one view of this situation which results from studies already made:

(i) In technology, including application of science and engineering, creative efforts are primarily concerned with the integration of previously existing knowledge to produce usable commodities and services, including, for example, systems devises, processes, methods and materials.

(ii) Pure research and phenomenon-oriented research is concerned mainly with the generation of knowledge about some phenomenon or other.

(iii) The knowledge generated from pure research and phenomenon-oriented research is made available to the scientist and technologists in several ways and through several channels.

(iv) Technological events are usually initiated within technology, in the presence of an ambient science. With a few

exceptions, it is usually difficult to establish a unique correlation between an important technological advance with a piece of knowledge generated by pure research. phenomenon-oriented research feeds upon knowledge generated in the field of pure research and phenomenon-oriented research. However, there are several interconnections across the two spheres of activity.

A major difficulty for many industrialized countries is that information users in the pure and phenomenon-oriented research sectors tend to have a communication circuit, both personal and documentary, which excludes interaction with other sectors. The communication linkages between sectors have to be developed. This situation is one that developing countries will want to avoid.

Kinds of Information Sought and Services Used

The user can first seek information by:

(1) Going to a library for an identified document, or
(2) Making an enquiry of an information service, or
(3) Asking a colleague or other acquaintance.

The third approach may lead to an enquiry to an information service which may lead to a request for a document. Where an extension or dynamic information service exist, it can identify the need, find the information and deliver it in some suitable form without the user making more than a passive initiative.

The totality of services provided by libraries and other information services is made up of several different types of services to meet demands for the provision of specific documents identified and named by the user; the provision of documents which the user does not specify or identify individually and of information analysis service, can be of a nature that assumes a demand before it is voiced, thereby requiring the staff of such an information service to take a very active role in information gathering and disseminating.

Value of Processed Information

Some benefits likely to result from a larger availability of processed scientific and technical information can be cited as:

(a) Improved capability of a country to take advantage of existing knowledge and "know-how" achieved elsewhere.

(b) Rationalization and systematization of a country's research and development efforts in light of knowledge already available.

(c) Wider knowledge base for the solution of problems.

(d) New alternatives and approaches to the solution of technical problems, and options for minimizing future ones.

(e) Improved effectiveness and efficiency of technical activities in the production and service sector.

(f) Above all, better decision-making in all sectors and at all levels of responsibility.

More specifically one economist, D. Lamberton, has said, "in a world..... where the firm is obliged to make unique and crucial decisions to optimize and to innovate, the making of such decisions puts a premium on information; its acquisition, storage and utilization become a major business activity". National economic growth is the sum of the growth of each and all economic units within the state. The contribution of information to national welfare cannot any longer be doubted, but the quantification of this contribution is extremely difficult. It is equally difficult to define the optimum level of resources which should be devoted to the information input at either local, company or national level.

Strengthening National Information and Documentation Systems

This will increase the flow of information available for the final users, both from foreign and national sources. In developing countries, information services serving the interests of small and medium entrepreneurs have already demonstrated their efficiency. For example, from 1960 to 1970 the work of the Rubber Institute in Malaysia led to 100% rise of rubber yields in Malaysian small holdings and the work of the International Rice Research Institute led to a 30% rise of rice yields in the Philippines. Comparable

countries in the region, without the same information sub-systems, hardly moved at all during the same period.

Sound management of national information and documentation systems can provide information to the user at a lower cost. It is usually recognized that highly educated professionals (i.e users) spend around 20% of their time looking for information. The management of national information systems provides other advantages. e.g

(a) Shortening the delays between question and answer,
(b) Enabling potential users to start using information, and liberating any country from excessive dependence on foreign-managed technology.

Scientific and technical information is increasingly recognized valuable by those concerned with the development process world-wide. The United Nations' World Plan of Action for the Application of Science and Technology to Development expresses the following sentiments: "A country without an indigenous scientific and technological capacity has no means of being aware of its own needs, nor of the opportunities existing in science and technology elsewhere, nor of the suitability of what is available for its own needs".

The second United Nations Development Decade should provide a systematic and adequately supported effort to improve the facilities and arrangements for the transfer of existing knowledge and technology from developed countries to less developed ones. Developing countries require scientific and technical information systems of their own, suited to the type, capacities, and location of the producers and users of such information and giving emphasis to the type of knowledge most needed for economic and social development. Such internal systems must be effectively connected with the information network of the highly developed countries.

Ways of coping with the User's Needs

Presently the crisis in information is the Problem of growth. There is what I have already mentioned called the "Information Explosion", a term analogous to the "population explosion". The growth of this information has strained the traditional way of processing information to cope with the users's needs.

(a) Abstracting:

Articles containing many pages are abstracted to provide quick information to a user who is busy. Abstracts should contain enough information to satisfy the information needs of a busy reader and should enable him/her to decide whether the full paper is worth going through or not. These abstracts are made good enough to meet the requirements of abstracting journals e.g. the Biological Abstracts.

(b) Translation

This is where documents are translated to meet the requirements of users. Access to translations has been much forced by the cover-to-cover translations of important journals, by the creation of indexes to translations, by the improvement of translating facilities and by the development of skill with language as part of the training of information specialists.

(c) Longer Summaries or (Letters)

These are published in journals and include information on the purpose, methodology and result of research and leave out experimental detail which can be deposited centrally.

(d) Current Awareness Service

This service, which is a type of indexing service came on the scene since the 1950's. Such services are generally desired mainly to bridge the time between the publication of a primary document and its inclusion in an abstracting or indexing periodical e.g. chemical titles, current papers in physics, current contents etc.

Current approach makes a direct demand on the announcement mechanism of the communication system. The announcement mechanism should have appropriate devices providing a direct link between the user and the communication system. These devices are called current awareness services.

(ii) Characteristics of a Current Awareness Service

(a) It is an announcement mechanism usually in documentary form.

(b) It is designed to meet or help cultivate the current approach to information.

(c) Such a service is not usually intended to answer any specific query as current approach to information is only for obtaining a panoramic view of current development.

(d) Recent developments in a subject field are shown, in a current awareness list, through a judicious selection and featuring of current literature in the field.

(e) Such a service is usually on an broader subject area so that a user gets a view of not only his own subject of research which is included in it but also related subject developments in areas which may influence his own field of work.

(f) A current awareness service is mainly addressed to those users who cannot depend entirely on their own informal channels - what they miss there, is intended to be made up to a large extent through such a formal service.

(g) Compared to all other formal channels, speed or timeliness is the essence of a current awareness service.

(h) Due to the very nature of current approach, ease of scanning has to be ensured.

(i) Current awareness list if for temporary use only.

(iii) Current Awareness Bulletin Presentation

(a) Contents - by journal
(b) Broad Subject headings
(c) Facsimile Reproduction
(d) Classified Arrangement
(e) Under the headings of names of divisions of the institutions.

(e) Selective Dissemination of Information (SDI)

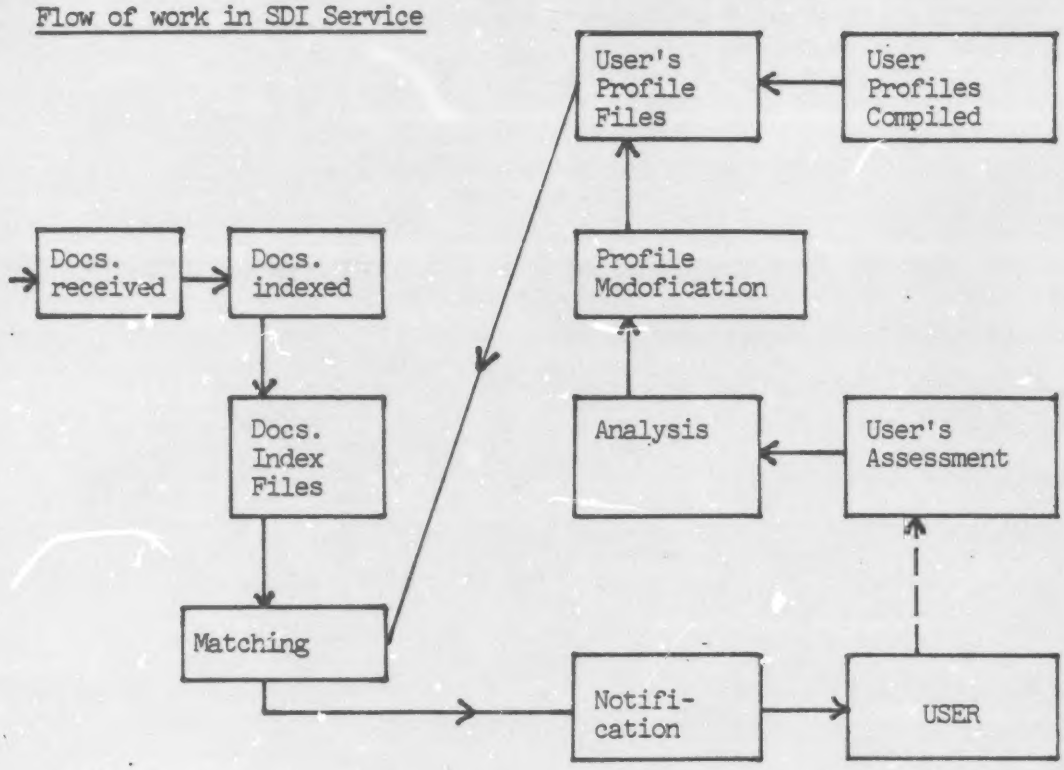
(i) Every user in a current awareness service has to make some effort in becoming aware of the new information apart from the effort put in by the provider of new information by way of compiling the current awareness list.

It was felt that an information system should devise a mechanism by which a continous surveillance is kept over the documents being admitted into the system with a view to find out quickly the relevance of each document from the point of view of each user's interest.

LUHN defines SDI as that service within an organization which concerns itself with the channelling of new items of information, from whatever source to those points within the organization, where the probability of usefulness in connection with current work or interests, is high.

(ii) Previously documents were being acquired, classified, indexed, and placed on shelves without browsing the reader's interests. The new emphasis is that each user will have to be studied first and represented in a way which could be easily be compared with the contents of the incoming documents. Matching of documents takes place, and after this, when it is found that it more or less conforms to the interest pattern of user A, an intimation is sent to him. In a similar manner, member B may get an intimation for documents 2 and 5 etc.

Flow of work in SDI Service



Users Profile

(i) Select the group of users who require such a service e.g. Economic Planners.

(ii) Interests of each user or homogenous groups of users are ascertained and represented in the form of a pattern of terms, keywords, code Nos, etc. Such a record of interest is called a profile. These individual profiles are then organized into a users profile file.

Users' Profile Making

The use of keywords from an accepted thesaurus is the most used technique for the maintenance of user profiles. The use of a thesaurus for describing areas of interest and indexing of documents ensures control of vocabulary and facilitates matching of the two files.

Profile Matching

Determining the level of match between a user and a document file.

(f) Bibliography Compilation

Bibliographies are many and various. These can be termed as "closed" lists of references to a particular subject, covering the information resources available on a subject for a specified period of time, in specified languages etc.

(g) Document Reproduction

Document reproduction i.e. copying and duplication, cannot be considered a purely technical matter. The level of reproduction techniques has a direct bearing on the effective use of information.

The need for rapid and low-cost copying facilities which arose several decades ago in clerical and office work, has led to the development of a variety of copying and duplicating process; first, the silver halide and diazo processes (i.e photography and dyeline copying); then, in the early 1950's, the thermographic and electrographic processes. The swift spread of new reproduction techniques is likely to play a great role in increasing the efficiency of scientific research as the invention of book printing did five hundred years ago. I will not deal with the theoretical and practical aspects of these processes as they are dealt with in a new discipline called reprography. Knowledge of the essentials of reprography is important both for information officers and for subject specialists in the different areas of research and practical work. The development and use of the various information retrieval devices is greatly enhanced and supported by the application of copying and duplication techniques.

Document Reproduction Processes:

Document copying	Document duplication
Silver halide process-	Typographic printing
Photographic	Letter press
Reflex	Gravure
Diazo processes	Flat bed (lithographic)
(Dyeline copying)	Spirit duplicating
Thermographic processes	Stencil duplicating
Electrographic processes	Offset duplicating
Micrographic processes	Use of addressing machines

Document copying refers to the processes employed for reproducing a page already printed. Duplication refers to those processes of producing multiple copies of typed script.

Areas where Processed Information is Urgently Needed in the Developing Countries Like Zimbabwe

Information as a key national resource is increasing in importance - with or without major new investments of resources in the information area. A co-ordinated approach to information problems offers the best prospects of maintaining proper planning and decision making in government. The need for a co-ordinated and well-planned approach is urgent in view of the relatively rapid growth of information needs and materials.

The information needs in the social, legal, economic, and technical spheres increase at a relatively faster rate and the structures for processing this information are particularly underdeveloped.

There exist several features in the socio-economic sphere of many developing countries which determine the living standards of their people and on which processed guidance data are either

lacking or too general to be practically useful. These features are:

(a) Population
(b) Food
(c) Resources and Energy
(d) Growth of Science
(e) Educational Growth
(f) Manpower Growth and Employment
(g) Transfer of Technology
(h) Research & Development (R&D)
(i) Industrial Growth and Production
(j) Urbanisation

In order for proper planning and decision making to take place, processed and well documented information is needed in the outlined fields.

Summary

There is a close connection between the developing countries' social needs, the satisfaction of these needs by production and services, and the application of science to determine the needs and choose the ways and means for economic and technical development. All these processes are interwoven with science. The intensive development of science and its immediate penetration into production are characteristic features of our age. The economic growth of Zimbabwe for example, is increasingly dependent on the tempo of scientific research and on the ability to apply the results of that research rapidly and completely to production.

It can be said that science and research continue to produce new knowledge in many developing countries, and that ways and means should be sought to utilise that knowledge in the national economy. On the other hand, science has reached a level of development at which the productivity of a scientist increasingly depends on a streamlined and efficient organisation of scientific activity, and on the speed and relevance with which scientists and technicians are supplied with specific information.

Many planners and decision makers complain of difficulties of communication within and between the various government bodies and private organizations. The development of documentation and information and the creation of efficient national information systems in Zimbabwe and other developing nations may prove distinct help and offer considerable relief to planners, scientists, researchers, and technicians occupied with basic problems as well as engaged in experimental work.

"The continuing increase in scientific knowledge, the growing differentiation and specialisation of science, the consequent rise in natural and social scientific output, and the increasing obvious interrelationships between the various fields of science call for a constant search for and application of new methods of documentation and information" (1)

---

(1) FID/DC (Working Group). Function and Organization of a National Documentation Centre in a Developing Country. UNESCO Press, Paris, Verlag Dokumentation, München, 1975. P. 13-14.

Bibliography

1) Board of Science and Technology for International Development. Scientific and technical Information for developing countries. Washington, National Academy of Science, 1972.

2) Gehrke, U.: Planning for a National Information and Documentation System. Report prepared for the Government of Kenya, by UNESCO. Paris, 1975; (Doc. RP/1973-1974/4.221.1)

3) Pauline A.: Handbook for Information Systems and Services. UNESCO. Paris,1975.

4) Price de Solla: Little Science, big Science. New York-London, Columbia University Press; 1963

PLANNING ECONOMIC GROWTH WITH EQUITY

AND

IMPLICATIONS FOR DATA SYSTEMS

by

Timothy R. Muzondo

Ministry of Economic Planning and Development

In the first development decade (1960-1970) the over riding objective of most developing countries was the attainment of maximum growth rates of GDP through rapid industrialization. It was expected that high growth rates of GDP and industrialisation would lead to significant transformation of the standards of living of the majority of people by providing large quantities of productive employment in the modern sectors of these countries. The experience was that moderate to high rates of growth of GDP and some significant measure of industrialisation were attained but this lead to very small or no improvement in the standards of living of the majority of people. The failure of industrialisation and growth of GDP to make a significant impact on living standards of the majority of people in developing countries was largely, though not exclusively, due to the fact that growth was concentrated in the modern industrial sectors and the fact that, for a variety of reasons, these factors failed to create large quantities of employment. These failures have lead to a re-assessment of the objectives of economic development in most developing countries. This re-assessment has led governments in most of these countries to adopt the objectives of not just economic growth but economic growth, redistribution and employment.

Two salient facts of life in most developing countries, including Zimbabwe, are worth underlining in order to understand the development process in these countries. One is that the large majority of people in developing countries live in the less advanced traditional sectors - the Tribal Trust Lands in the case of Zimbabwe. This fact means that any development strategy which focuses entirely or mainly on the modern industrial sector cannot, in the short or intermediate terms, be expected to significantly transform the living standards of those living in the less advanced traditional sectors. The "trickle-down" hypothesis - namely the view that the benefits of high rates of industrialisation will "trickle down" to all, including the poor, is a very long term, not short or intermediate term phenomenon.

The other factor is population growth. Rapid population growth in most developing countries has led to huge amounts of excess unskilled and in most cases uneducated labour which could not be absorbed in wage employment even if the modern sector grew at higher rates than those actually observed. This can be illustrated by making reference to the manufacturing sector. A manufacturing sector which employs 20 percent of the labour force would need to increase employment by 15 percent per annum in order to absorb the increment of labour in a total work force growing at an annual rate of 3 percent.

Assuming reasonable increases in technology and increases in labour productivity in the manufacturing sector, this means that the output in the sector would have to increase by between 30 and 45 percent annually. It may be worth noting that in Zimbabwe the manufacturing output grew at an annual average of 9 percent between 1954 and 1975 and the sector employs much less than 20 percent of the labour force.

Failing to obtain wage employment, the largely unskilled workers have joined the huge employment pool, or have become members of the rapidly growing "informal" sector. Others have become self-employed small farmers or rural artisans. The most unfortunate have simply become unemployed landless peasants. It is these groups who constitute the real poor in developing countries like Zimbabwe and it is much less those who are fortunate enough to land a job in the modern sector.

It is, we believe, appreciation and concern with all the above factors that most governments in developing countries have adopted the pursuance of growth, redistribution and employment as major objectives of economic policy. In the case of Zimbabwe similar concern has resulted in the adoption of Growth with Equity as the major objective of economic policy.

In this paper we describe, in broad outline, the elements of a comprehensive, conceptual planning framework for analysing policy measures and development strategies often suggested as appropriate for developing countries. The framework is particularly suited for handling policy issues of growth and income distribution but requires a new scheme for data collection which is more comprehensive than the standard National Income Accounts. It is apparent that policy measures and development strategies often suggested as appropriate for developing countries suffer from one major weakness - namely that they fail to account for the effect of adopting these increases on the whole economic system.

Debates on the question of the appropriate development theory and strategy for a developing economy have usually centred on the issue of the relative importance to be attached to the development of the industrial sector rather than the agricultural sector. Two development strategies are usually suggested. The first is an industrial strategy based on rapid industrialisation, and the second is the one that is based on first developing the agricultural sector.

An industrialisation strategy is based on the view that industrialisation is the key to development and that the role of the industrial sector - the advanced sector - is to pull, overtime, the backward agricultural or rural sector. The strategy often entails strong discrimination against agriculture through measures such as turning the terms of trade against agriculture, promoting import - substitution industries through high protection, allocating a minimum share of public investment to agriculture and not promoting the creation and development of rural institutions.

A development strategy based on the development of the agricultural sector is critical of the view of an industrialisation strategy which entails a neglect of the agricultural sector because it understates the importance of mutually beneficial linkages between agricultural and industrial development. This view points out that the fact that successful industrialisation in a number of developing countries has been sustained by broadly based agricultural growth and development. The major reason why a broadly based agricultural development is necessary to sustain industrialisation is that in most developing countries the overwhelming majority of the people earn their livelihood from agriculture than from any other sector. A growing and developing agricultural sector stimulates demand for industrial products, supplies cheap food for industrial workers and raw materials for agro-processing industries, earns foreign exchange to finance imports of capital and intermediate goods for industrialisation and facilitates the development of labour intensive small- and medium-scale industrial units in small towns and rural areas.

A development strategy based on the development of agriculture recognises the fact that in the early stages of industrialisation, when agriculture dominates the economy, a significant portion of resources must come from agriculture to promote and sustain industrialisation. However, the manner, and in some cases the magnitude of the resources transferred from agriculture to support industrialisation could and often do have significant adverse consequences on the growth and development of the agricultural sector and indirect adverse consequences on the industrial sector itself. Artificially low prices to agricultural producers, taxation of agricultural exports, an over-valued exchange rate, heavy protection of manufactured goods, including those purchased by the rural sector, and other measures which have turned the terms of trade against agriculture have dampened and in some cases destroyed incentives for agricultural growth and development. Too often these policies have been compounded by deficiencies in transportation, marketing infrastructure, poor extension services, and inadequate credit facilities. From an economic point of view, land taxation and the mobilisation of rural savings through financial institutions are far much more preferable and effective methods of transferring resources from agriculture to industry than these other methods and measures.

Just as there are various industrial development strategies so there are various types of agricultural development strategies. The three most important ones appear to be (a) a unimodal strategy; (b) a bimodal strategy; and (c) collectivisation and/or socialisation strategies. The choice of any one of these strategies can have a significant impact on the overall economic development of an economy.

The essence of a bimodal strategy is the promotion of a large-scale, commercial, modern and often capitalistic subsector which provides the bulk of agricultural output to satisfy the demand from domestic and export markets for food and other agricultural products.

The remainder of the agriculture sector is where most of the people live and is often relegated to subsistence existence receiving practically no or very little public or private investment.

A unimodal strategy is based on a "bottom-up" approach to progressive modernization of agriculture. In contrast to the bimodal strategy, which encourages the growth of a modern, commercial, large-scale and relatively capital - intensive subsector of agriculture co-existing with a traditional subsistence subsector, the unimodal strategy relies on a wide-spread application of labour-intensive technology to the whole of agriculture. Through a combination of agricultural research, land re-distribution and re-settlement, the provision of rural infrastructure, marketing facilities, extension services, the growth and development of rural institutions, appropriate and favourable national pricing policies and other measures, agricultural development is spread relatively evenly over the mass of the people.

The collective or co-operative forms involve some of the following: (a) the elimination of individual land ownership, (b) consolidation of land and some other assets into co-operatives or collectives which are then run jointly and benefits shared in a variety of ways among members; and (c) undertaking and promotion of both farm and off-farm activities. There are, it is important to underline, a variety of co-operative forms in agriculture.

It is worth pointing out that economic development strategies based on the development of the industrial sector or the agricultural sector are not, in principal, mutually exclusive. The complementarity, linkages and mutual dependence of industrialisation and agricultural development were underlined above. Equally, within the agricultural sector, the strategies mentioned above are not mutually exclusive. In principle, the unimodal and bimodal strategies are not mutually exclusive provided it is recognised that modern commercial agriculture does not require for its existence, sustainance, and prosperity, discrimination against the traditional sector; and provided it is recognised that progressive modernisation of the traditional and subsistence agriculture does not, in itself, necessarily imply the transformation of the entire agricultural sector into peasant agriculture.

Indeed (as we shall see in the case of Zimbabwe), it is possible and depending on society's social and economic objectives desirable (i.e. optimal) to have a strategy with a mix of modern commercial agriculture, progressive modernisation of traditional subsistence agriculture, and socialisation of agriculture all co-existing and with each fulfilling different social and economic development objectives.

The fact that it may be desirable to pursue an agricultural development strategy which includes elements of all the three agricultural development strategies indicated above has an important theoretical implication. Amongst other things, it means that the strategies for agricultural development and, indeed, the development of the economy as a whole, are not, and should never be, seen as the objectives of economic policy. There are instruments for achieving objectives and as such have no independent justification other thantheir efficacy in achieving those objectives. In evaluating development strategies it is, therefore, necessary first to identify the objectives of economic policy and, second, to analyse the effectiveness of strategies in the attainment of those objectives in a comprehensive and consistent framework. It is our contention that one major weakness of much of the debate and discussion an development strategy (and sectoral strategies) is that it is not conceived within a comprehensive and consistent framework capable of analysing the <u>total effect</u> of adopting the strategy on <u>all</u> the objectives of economic policy. Too often the economically unsophisticated policy makers are persuaded to adopt development strategies and policy measures by arguments based on the most partial of economic analysis.

The overall economic development strategy pursued in the past in what was called Rhodesia does not fit neatly into any classification mentioned above. As a result of past development strategies the economy is dualistic with, on one hand, a fairly sophisticated modern sector (which includes large-scale modern commercial agriculture) and, on the other, a rural subsistence sector which is highly underdeveloped. Over the years public and private investments have been concentrated in the modern sector and the rural subsistence sector has, generally, received little or no public investment.

As a result there is a huge differential in labour productivity between the two sectors which has given rise to skewed income distribution and income earning opportunities between workers in the modern and rural sectors. While the discrimination against the rural subsistence sector is the most obvious manifestation of past development strategies it is also apparent that during some periods, development strategies had strong elements of discrimination against the agricultural sector as a whole.

The Second World War gave rise to transportation problems between Rhodesia and sources of import supply. This acted as a significant boost to industrial development. This was reinforced by the increase in size of the market resulting from, inter alia, an influx of overseas military personnel. Much of the industrial development taking place during the period was mainly in the labour-intensive industries such as textiles, clothing and food processing even though this was the period during which the iron and steel industry was established. The industrial development taking place during the period was in most cases complementary to agricultural development and appeared to be in labour-intensive industries in which the economy had relative comparative advantage. Nevertheless, there was an important degree of protection afforded to domestic industries. It is significant that by as early as 1949 the manufacturing sector already accounted for nearly 14 percent of GDP.

The accession to power in South Africa of the nationalist government in 1948 and formation of the Federation of Rhodesia and Nyasaland in 1953 gave further stimulus to industrial growth and development in Rhodesia.

The former because fear of nationalist policies in South Africa caused an outflow of industrial capital from that country to Rhodesia; the latter because the Federation created a larger protected market for the maunfactured products of Rhodesia - the most industrially advanced partner in the Federation.

During the period 1940-1965 the manufacturing sector enjoyed a measure of protection and trade policies were, in general, based in favour of promoting industrialisation. Government in general favoured a free trade policy and only introduced slight protective measures for infant industries. During this period the development strategy did not, therefore, strongly discriminate against the agricultural sector. This observation is valid inspite of the strong discrimination against the rural subsistence sector.

The declaration of UDI in 1965 and the subsequent imposition of UN economic sanctions gave a further stimulus to industrial development in Rhodesia. Largely as a result of the need to conserve foreign exchange for balance-of-payments reasons, a significant degree of important substituting industrialisation took place since 1965. The manufacturing sector which contributed 14 percent to GDP in 1949, accounted for nearly 20 percent of GDP in 1965. The abandonment of free trade policy since 1965 gave high protection to the manufacturing sector. As a result in less than 10 years the manufacturing sector was able to increase its share from 20 percent (in 1965) to 25 percent (in 1974).

Unlike the previous bout of industrialisation the last development took place under high protective barriers accorded by quantitative controls of imports rather than tariff protection. The questions of comparative advantage, cost efficiency and international competitiveness, which appear to have played an important influence in designing the earlier industrial development policies, appear to have been relagated to, at best, secondary consideration in pursuit of the need to conserve foreign exchange. During this period there was, therefore, strong discrimination against agriculture as a whole and the terms of trade turned strongly against the sector.

There are three subsectors characterising the development of Rhodesian Agriculture. The first is the highly commercialised, large-scale mainly White agriculture. The second is the commercialised small agriculture often referred as African Purchase Areas. Finally, there is the large subsistence sector usually referred to as the tribal trustland sector. Estimates indicate that as of 1977 5,000 farms with an average of 2,500 hectares per farm belonged to the first category; 8,500 farms with an average of 60 hectares per farm belonged to the second category; and 700,000 holdings with an average of less than 5 hectares per holding belonged to the third category. The unequal opportunities in the agricultural sector is more critical because the White farms are concentrated in areas with better land, rainfall and areas better served with agricultural infrastructure than the African farming areas.

The land distribution pattern, the provision of agricultural infrastructure and services and other factors contributed to the development of three subsectors with very different features and serving very different policy objectives. The White commercial subsector produced most of the agricultural surplus for domestic and export markets. The African Purchase Areas produced most of the marketable surplus of the two other sectors (APA and subsistence). Production in the subsistence sector was on the whole equal to subsistence requirements. Much of the public and private investment in agriculture have been concentrated in the White sector and the subsistence sector has suffered most from lack of public support.

It should be apparent that the development of agriculture in Rhodesia was not bimodal. The introduction of APAs into the sector destroyed what could otherwise have been a bimodal development strategy.

The overall economic development strategy pursued in the immediate years before independence could thus be described as strongly discriminating against agriculture as a whole with terms of trade turned against this sector. Within the agricultural sector there was strong discrimination against African agriculture especially the subsistence subsector.

There does not appear to be strong indications that the current Government is prepared to open up the economy to significant foreign competition even though there appears to be a committment to progressively move away from quantitative to tariff protection of domestic industry. It seems, therefore, that the discrimination against agriculture as a whole in the development strategy may continue in the short and perhaps intermediate term.

However, the Government is committed to important structural changes and reforms within agriculture. Mainly because of the inequity in the distribution of land, the inequity in the provision of agricultural infrastructure but also because of the belief that the current land utilisation is not efficient, Government is committed to land reform and redistribution. In order to satisfy the twin objectives of efficiency (growth) and equity, the conception is that the unutilised and underutilised land be acquired and distributed to peasants in re-settlement schemes.

In carrying out land reform Government has introduced two additional farming models - state and co-operative farms.

These models will co-exist with small-scale individual holdings in the re-settlement schemes, the traditional holdings in the subsistence sector and the modern large-scale commercial sector. In addition, Government is committed to re-directing public investments to the subsistence sector to provide the necessary infrastructure, marketing facilities, extension services for the development of this sector. It is thus apparent that in the agricultural sector of the future there will be neither a single unimodal, bimodal or socialised agricultural development strategy. Instead, there will be a combination of all these models. It is perhaps the committment to allowing and, indeed, promoting the co-existence of such a variety of farming models to suit local objective conditions and the requirements of, amongst other considerations, growth with equity, that distinguishes the agricultural development strategy in Zimbabwe. The strategy has its

conceptional foundation in the belief that farming models and the implied agricultural development strategies are not, in themselves, ultimate goals of socio-economic poliy, but instruments for achieving improving the living standards of people under dynamic conditions of growth and equity. It is this fundamental conception which underlines the conceptual framework which we suggest below.

Past economic development appear to have been based on the objective of promoting economic growth subject to the condition that most of the benefits of that growth were distributed largely to a small segment of society - the white group. The concern with growth is evidenced by the fact that on the whole investments - public as well as private - were directed to areas in which rates of return were highest. This largely explains the neglect of the rural areas which, for a number of reasons, including poor soil fertility and rainfall, returns to agricultural investments are low. The fact that there were large amounts of either vacant, un-utilised or under-utilised land which could have been distributed and developed for, Africans but was not, is evidence that previous governments constrained their pursuit of growth by the need to ensure that the benefits of that growth accrued mainly to the white group. The unconstrained pursuance of growth would have led previous governments to remove many economic distortions in the products and especially the labour markets. The fact that manpower policies were based on the need to train local but white manpower (constituting no more than 5 percent of the potential labour force) and when this was insufficient, to encourage white immigration, when thousands of young, able and well-educated blacks remained untrained and unemployed, is another example of the fact that the pursuance of the objective of growth was heavily constrained by the need to ensure that the benefits of growth mainly accrued to the white group.

It seems, therefore, accurate that the broad objective of economic policy of previous governments was the attainment of Growth with Inequity by Race. The current government, on the other hand, has chosen the broad objective of economic policy as the attainment of Growth with Equity.

Equity involves (a) equity with broad sectors - namely modern, rural and the informal sectors; (b) equity within sectors; and (c) equity by racial groups. It is, we believe, within this broad policy framework that government measures and strategies can be understood.

The main thesis is that discussions of, and debates about, economic development strategies and sectoral development strategies (such as rural development and industrial strategies) cannot, usefully, be evaluated without reference to the objectives of economic policy. Specification of the objectives of economic policy is, therefore, a necessary first step in evaluating development strategies. This paper also suggests that in designing and/or evaluating development strategies in specific cases it is not sufficient, indeed, it is anti-economic to simply point at or count, one or two advantages of one strategy over another.

Rather it is necessary to construct an overall, quantitative, consistency and comprehensive framework in which all the economic effects of development strategies and policy measures can be analysed in relation to the stated objectives of Government policy. It is the total impact of policy measures and development strategies on the entire spectrum of policy objectives which needs to be analysed in making rational economic decisions.

Decision makers in most countries and perhaps more so in developing countries are not likely to be satisfied with a situation in which their role in economic policy making is limited to that of specifications of objectives of policy and the choice of the policy measures and strategies which maximise those objectives is left to technocrats.

In this paper we suggest that a systems analytic comprehensive planning approach provides the basis for such a framework. A systems analytic approach requires that in analysing socio-economic policy, the total systems objectives and, more specifically, its performance measures be speicified. Second, it requires that the available systems resources be specified. Third, it requires that the dynamic systems environment - namely, its dynamic contraints, be specified. Fourth, it requires the specification of the system components.

The main consideration is adopting a system analytic framework in the desire to analyse the links between on one hand, growth, equity and especially measures to eliminate absolute poverty and, on the other hand, the need to analyse standard issues of savings, investment, balance of payments and employment. The purpose of the proposed framework is to illustrate how different seemingly unrelated economic policy and strategy issues are inter-linked and interwoven and, hence, to highlight the inadequacies of partial analyses and the need for comprehensive equilibrum approach in analysing policy issues and in economic planning.

The need to analyse issues of equity and the elimination of absolute poverty dictates the need to develop a data scheme which potrays the living standards of different socio-economic groups. National income accounts were conceived in a framework which was pre-occupied with pursuance of growth to the exclusion of equity. In order to appreciate and empirically analyse the issues related to growth with equity a different data framework is, therefore, required.

The approach which we are advancing is economic and its obvious interface with political considerations is with respect to objectives of economic policy.

The view taken in this paper is that the ultimate objectives of economic policy are related to living standards and objectives such as employment creation, industrialisation etc. are but instruments for achieving higher standards of living. The concern is, however, with living standards of groups of society concern which requires disaggregation of society into different socio-economic groups. It is necessary to consider all groups,

including more afluent groups, since it is the interplay of their respective contributions to the economy and their behaviour which determines, along with other factors, the way in which the economy evolves.

Under our proposed framework conflicts between growth and equity translate into conflicts between the economic interests of different groups.

The framework adopted is very general. It does not require the specification of a welfare function even though a number of welfare functions could be specified. The approach is to generate a policy feasibility space reflecting different packages of policy measures. The approach, therefore, permits the choice of policy measures on the basis of quantifiable costs and benefits when total systems costs and benefits are considered.

One consequence of the interface between the economic planner and political considerations at the level of objectives is that it leads to a more relevant analysis of political issues and, therefore, contributes constructively to political debates. The approach is directed at identifiying - quantitatively what the inequalities are, how they are inter-related and inter-woven with other economic phenomena, and the way in which policy instruments, measures and structural reforms might influence them together with other factors and phenomena, in the system as a whole. For example, an increase in the minimum wage by a certain percentage may reduce the inequality between the lowest paid workers and other workers in the urban sectors which is desirable from a certain point of view of equity. But if the total systems impact of this measure is traced within the framework proposed one may find and quantify the opportunity cost of the achieved equity in terms of reduction in jobs (or a lower rate of job creation), increased gap between standards of living of urban workers and peasant farmers, the adverse effects on balance of payments and rate of inflation, the impact on capital intensity in the economy, the rate of savings and, therefore, investment etc.

The systems analytic comprehensive framework suggested in this paper is built upon two pillars. The first is the modular analytical framework specifying for a set of interconnected subsystems, the major relationships between variables within and between the subsystems. The second is an elaborate complementary data and classification system. The two pillars can be combined together in an accounting matrix containing not only the comprehensive data system for any given period but also the whole algebraic specification of the dynamic model linking the various variables and subsystems and permitting the derivation of future equilibrum values and, consequently, future accounting matrices. The framework incorporates the policy means which can be used as levers to move the system in any desired direction consistent with any multiple welfare function.

In its simplest and agregative form the analytic system can be decomposed into three major subsystems. The first is the production structure; the second is the employment and distribution of value added generated by production activities; and third is the final demand sector consisting of consumption, investment, exports etc.

The system should be internally consistent in both the static and dynamic sense. Static consistency requires that, starting at any point amongst the three subsystems, the feedback mechanism throughout the system should yield the same initial values. For example, if the starting point is a given pattern of income distribution and employment, this implies a corresponding expenditure and investment pattern which in turn implies a corresponding output mix which then translates back into initial pattern of income. distribution and employment.

The logic underlying this modular planning framework is more complex than implied in the above outline.

Again it does not matter what the starting point of the system is but since the purpose of the system is to raise living standards it is logical to begin with consumer wants, and needs. These can be satified by a certain net output vector of goods and services. To meet this demand vector a whole set of production activities is brought to bear. The production activities generate a derived demand for the factors of production which yield factorial income distribution and GNP. The factorial income can then be mapped into distribution of income over households and institutions (i.e. government and companies) which completes the system by providing the means of satisfying household and Government wants, as well as investment requirements, thus bringing the system back to the initial point.

This framework serves as an organising scheme, an agenda, for further analysis and research. The modular approach has several advantages. It means that the complex interrelationships can be discussed and/or research parcelled out module by module. The approach brings out explicitly the relative strengths and weaknesses of the various modules and their relationships.

A critical question is how to formulate this conceptual framework in such a way that it can be incorporated into a corresponding data system and accounting matrix framework. Therefore, to complete the system it is necessary to fully understand the mechanisms at work an the information required and the classification schemes which are appropriate (in accounting sense) to record these mechanisms.

It is necessary to describe in detail the major modules of the system i.e. (i) households and living standards; (ii) savings, investment and flow of funds subsystems, (iii) final demand and (iv) the structure of production and asset ownership and its relationship to income distribution and employment. For reasons of space we shall not do this here. However, because of the interest in growth with equity we shall outline some of the elements of the first and the last modules i.e. household and production modules.

The usual classification of households is by income. However, concern for equity requires that policy be directed towards particular socio-economic groups which are identifiable directly in policy terms. Examples would be semi-skilled and unskilled workers, landless rural labour, workers in the informal sector etc. It follows that an operational approach must be based on socio-economic classification distinguishing identifiable (but relatively homogenous) groups which can directly be reached by policy measures. Amongst other things, such classification could be based on (a) location, (b) sociological considerations, race, religion etc. and (c) wealth (ownership or access to assets e.g. land). The essence of development planning is to design a strategy which is appropriate in the light of the policy objectives. Such a strategy entails manipulation of policy instruments to guide the economy along a desired development and growth path. There are two critical determinants of the development process overtime - the structure of production and pattern of ownership of the factors of production in the base period.

The classification of production objectives is crucial in deriving the pattern of income distribution and of employment. Dualism in development means that there are virtually two economies operating side by, and largely independently of each other. Just what the linkages are and how much dualism may exist can only be perceived with appropriate classifications of production activities. For example, if retail trade is classified as a single category, there is no way of telling how far the expenditure of modern sector households "trickle down" into demand for services of traditional unskilled labour or workers in the informal sector. Yet these are linkages which are of indirect interest to policy makers.

Unless production is classified with reference to the level of technology, the form of organisation and location it is likely that the extent of dualism will be understated. One important consequence of inappropriate classification of production activities is that it may lead to unwarranted optimism about the extent to which a strategy which concentrates on growth of the modern sector will ultimately benefit groups in all sectors of the economy.

Analytically it is useful to distinguish between policy instruments and measures which are available to government given the institutional structure and pattern of resources and those which, if undertaken, change the pattern of ownership directly and thereby alter the underlying structure of the economy. The first set of instruments imply marginal quantitative changes in policies within a socio-economic structure. In contrast, structural changes and policy reforms affect directly the distribution of resources and the wealth pattern amongst different groups in society during the planning period.

In the proposed framework the effects of a given package of policy measures on a set of objectives can be stimulated. The result is what may be called the feasibility policy space. By expanding the package of policy measures the feasibility policy space is similarly expanded. Thus many desirable values of all or most objectives could result from a more ambitious package of policy means which would reduce or eliminate altogether, a previous trade-off between equity and growth.

The main policy instruments and measures in the proposed framework may be classified as follows:

A. Policy instruments:

(a) fine tuning instruments:
  (i) use of efficiency prices, commodity taxes, subsidies; removal of artificial price distortions;
  (ii) removal of general market imperfections;
  (iii) appropriate exchange rate and commercial policies;

(b) fiscal instruments:
  (i) direct taxes on households and companies;
  (ii) actual and imputed transfers to households;
  (iii) transfers to companies;

(c) monetary and credit instruments

B. Structural changes and reforms

(a) land reform;
(b) changes in the ownership of other physical capital assets;
(c) educational reforms.

C. Institutional reforms.

The packaging of policy instruments, structural and institutional changes will vary depending on the need to improve the efficiency of an existing system rather than changing its structure to achieve more equity.

Fine tuning instruments will have an impact on the entire system given the inter-dependence within the subsystem. But the most noticeable impact will be on the structure of production through the resulting changes in the output mix between production activities and the input mix within activities.

Thus the removal of price distortions such as credit subsidisation favouring large entrepreneurs and farmers and an over valued exchange rate, would tend to lower the cost of capital below the value of its marginal product. In the proposed framework the specification of production activities allows us to measure the impact of removal or reduction of price distortions on the demand for inputs. The quantitative impact on the magnitude of the substitution elasticities would, in the capital labour case reflect the relative increase in employment, resulting from a relative fall or increase in the wages or in the wage/rental ratio.

Reduction or removal of existing market imperfections in both input and output markets entails reducing monopolistic and monopsonistic imperfections which increases competition through such measures as monopoly legislation and prohibition of discriminatory pricing.

In a country like Zimbabwe in which commercial policies and other policies have interfered with competitive conditions, reduction of market imperfection could have significant impacts. The various instruments used to protect domestic industries from foreign competition in a strategy of industrialisation through import substitution (such as import control schemes etc.) provide a large rents to these industries.

There is empirical evidence that the overall effect of the import substitution phase is to: (a) accelerate the gap between the modern and traditional sectors; (b) discriminate against agriculture (c) encourage the adoption of inappropriate technology. The distinction between import and domestic productive activities in the production subsystems permits us to measure both the efficiency cost of such policies and whether they might have contributed to unemployment and poverty by discrimination against the traditional sector and the urban informal sector activities.

Fiscal instruments can have a significant redistributive impact. Fiscal instruments can be incorporated easily into the proposed framework thus permitting analysis of the impact on living standards of different household groups. In general, fiscal measures, while potentially capable of reducing income inequalities between income groups, have only an indirect effect on the productive capacity and resource endownment of the poor groups. For example, higher quality, subsidised education and medical services to the rural poor may, overtime upgrade their skill levels and their human capital and productive capacity.

Monetary and credit policy can play some part in reducing disparities in living standards and can act as a catalyst by encouraging the growth in output of traditional and formal activities. Typically, monetary and credit instruments tend to favour enterprises and groups in the modern sector rather than those in the traditional or informal sectors. There is a great need for credit and savings institutions catering for traditional and informal activities, so as to eliminate the unserious charges which often prevail in these sectors.

A final type of policy instrument which can be formally incorporated in the consistency framework is the allocation of public investment to projects and sectors. Any initial increase in sectoral output resulting from new investment projects (or sets of projects) will require additional intermediate inputs from other sectors. In turn the resulting increased production of these supplying sectors can only occur - in the absence of excess capacity at the outset - through additional investment which will augment the productive capacity.

Furthermore, as income rises throughout this process generate additional demand which can be satisfied only through still more increments to the stock of capital overtime.

Even though the treatment of public investment in the proposed framework could not simulate all these indirect effects, it does provide an approximation to a general equilibrum approach to investment projects.

The set of policy measures which can be incorporated into our framework is made up of structural changes and reforms. Land is unevenly distributed in Zimbabwe. There are at least three major reasons why an uneven land distribution generates an uneven income distribution and vice versa: (a) the return to land accrues to the large land holders in the form of rent, whereas in the case of the more equal size distribution (small-scale agriculture) rental income can, usually, not be distinguished from labour income which accrues to the smallholder; (b) there is a substantial amount of empirical evidence suggesting that constant returns to scale prevail in agriculture and that large estates tend to underutilise the available land resources so that labour intensity per unit of land is

negatively correlated with the size of the land holding; (c) the institutional and political structure which accompanied the land distribution in the past favoured the large farmers through their easier access to credit and extension services, the greater availablitiy of public investment infrastructure projects, a distorted price system and a degree of monopolistic or monopsonistic power.

These three reasons are in fact processes which can be modelled in the consistency framework. First, the sectoral income distribution resulting from production on large holding maps into a more unever personal income distribution than generated by a land distribution favouring small-scale agriculture.

The causes of this differential effect are partially technological and partially intrinsic to the pattern of ownership itself. The large farmers are likely to use more capital-intensive techniques (or at least methods using a higher proportion of intermediate inputs) than small farmers. This phenomenon is reflected in a reduced share of value added in gross output and a smaller share of labour income relative to non-labour income, to the extent that mechanised techniques are used. Furthermore, it was mentioned in (a) above, the land income per se is received by a few landlords or large farmers in the uneven land distribution case and is spread among a large number of small farmers (becoming almost indistinguishable from labour income in traditional agriculture) in the alternative case of an even size distribution of holdings. The combined effect of these forces is a high degree of concentration in the personal income distribution in the former case and a low degree in the latter. This first process is a good example of the interrelationship in our framework between the initial resources endownment and the choice of technology which, in turn, is translated into a new mix of production activities or, at least, a changed derived demand for factors of production. But it is important to underline the fact that labour and capital productivity is likely to be much higher in large commercial farms.

The second factor above signifies that land-redistribution resulting in smaller average holdings need not necessarily reduce output. Indeed, if constant returns to scale predominate in agriculture, a breakdown of large land units into smaller ones would yield exactly the same output, provided the output mix remains constant and the volume of <u>all</u> inputs also remains constant. In fact it is very likely that more labour inputs per acre is applied to land on small units than on larger holdings. Hence, in theory (assuming constant returns to scale, no change in technology, and the application of more labour input), total output should rise consequent to redistribution. In practice the technology used by small farmers is likely to be different from that used by large farmers. Institutions which previously were favouring large farmers may not be adapted immediately and/or effectively to solve the needs of small farmers. This is true, for example, in the areas of credit facilities, extension and research facilities. Finally, the level of certain types of inputs such as the quality of management may actually decline as a consequence of land-redistribution. For all these reasons, one should normally expect a rise in total output and even constant output to accompany land-redistribution except, of course, in the case such as that facing Zimbabwe, where the re-distributed land is currently unutilised and/or underutilised. In the latter case the trade-off between output and more equal income distribution may not exist even in the transitional period. In such a case the possibility of Growth and Equity is a real one.

In summary, the systems analytical framework makes it possible to *analyse quantitatively* the direct and indirect effects of changes in the initial endowment of land and of the inter-relationship between the latter and the whole set of production activities,

A second type of structural change which can be modelled in the framework refers to the pattern of ownership of capital and the operation of capital markets. Zimbabwe is characterised by a great concentration of wealth and capital assets, on the one hand, and an imperfect capital market on the other. Since increased production is normally financed from retained earnings often in unincorporated family firms or from direct investment from abroad, the environment is not conductive to the development of an active capital market on the demand for capital side. On the other hand, the lack of adequate financial intermediaries to help to channel savings into investment means that the supply of capital and loanable funds is often institutionally short circuited as well.

Here, as in the case of land, the inter-relationship between the pattern of ownership of capital assets and the structure of production can be modelled in the framework.

Thus the uneven endowment of capital both influences and is influenced by an institutional and technological structure favouring "modernisation", the adoption of foreign advanced techniques and, in general, the continuation of economic dualism. A specific measure which can be simulated within the framework is the institution of new financial intermediaries which would increase the transfer of funds between sectors and household groups. In general, some widening of the ownership of capital assets and especially of access to money and capital markets can be a key tool in encouraging the adoption of new and more productive technologies by poor household groups, whether in agriculture or in the urban informal sector, and thereby in improving their standard of living overtime.

Education and skill formation represent a form of human capital formation. As the productivity of a worker is increased with the amount of capital goods available to him or her, an individual's productivity normally rises with his or her level of education and skills. Consequently, any changes in the educational system benefitting the poor, such as a greater emphasis on higher-quality and more relevant primary education than on higher education and, on informal and recurrent education in the rural areas rather than on formal education in the urban areas, should result in a larger share of factorial income accruing to the poor groups. The issue is less often one of increasing public expenditures on education than one of altering the composition of the expenditures. It has been well documented that the prevailing uneven distribution of human capital is reflecting in many developing countries large differentials in the wages, salaries and labour incomes of the self-employed received by the various household groups. In Zimbabwe the large income differentials in wages and salaries in the modern sector can be explained, in part, by differential levels of human capital which, because of past manpower policies, maps onto unequal income distribution by race.

THE COMPUTER SYSTEM REQUIREMENTS

FOR ZIMBABWE'S PADIS-NIDC PROPOSALS

by

Ms. Nomusa B. Chitepo

Research Economist

MINISTRY OF ECONOMIC PLANNING AND DEVELOPMENT

Since computerization requirements in a number of institutions within government and outside are still being studied and considered, and because the overall requirements for a National Information and Documentation Centre (NIDC) have not yet been detailed, it is not possible at this stage to specify the computer system for the centre. I shall therefore only treat the very broad requirements by drawing attention to the salient features of the PADIS project and their implications with respect to the NIDC and its computer system.

1. PADIS components and the accompanying requisite computer systems.

The proposed Pan-African Documentation and Information System comprises six main subsystems, namely:

- PADIS-DEV: the economic and social development information (bibliographic) component
- PADIS-COM: the collection of complementary files prepared in collaboration with regional and subregional institutions
- PADIS-STAT: The statistical component constituting numerical data bank
- PADIS-NET: the telecommunications network for the system interconnection and information dissemination throughout Africa
- PADIS-PROM: project monitoring of ongoing projects and research work
- PADIS-ADM: a management information systems for ECA and ECA-managed projects

In short the PADIS proposals envisage a set-up where the information resources on the African continent are so organized that the time-lag between the collection and processing of information and its dissemination is minimised. Obviously, in this age of technology, we have little option but "go automatic" - to computerise, somewhere along the line. I shall begin by very briefly considering the broad implications of some of the subcomponents of the PADIS project on the computer system requirements.

(a) PADIS-DEV: This component is to be materialized as a reference file and will include the development plans of the African countries, analyses, facts, trends, official policies, prescriptions for decision-making, evaluations, operations experience and other tools and related information concerning development activities in and for Africa.

It is intended that all this information be indexed and loaded onto computer for easy retrieval. This vast bibliographic collection requires that standard indexing and input format be developed and adhered to facilitate the transmission of files from one regional headquarter to another. Furthermore the information retrieval software becomes very important for two reasons. Firstly for reasons of efficiency, and secondly, but more importantly, for the need for portability, related to compatibility of systems.

The PADIS Central Coordination Office in Addis Ababa has mounted MINISIS (a version of ISIS - the Integrated Sets of Information Systems) on a Hewlett-Packard computer (HP 3000/III). This software was developed for IBM and IBM-compatible systems, and the likelihood of being compelled to use these systems for the sake of consistence and compatibility with the head office at Addis, could present some constraints, and indeed some very real problems in some countries, including Zimbabwe, with regard to hardware acquisition.

(b) PADIS-COM: Being a bibliographic component as well, has similar requirements to those for the PADIS-DEV component.

(c) PADIS-STAT: PADIS-DEV and COM are relatively simpler files to create in that once the documents have been indexed, catalogued and entered onto computer, there are unlikely to be any alterations to the contents of the individual records. The system would then operate rather like any library, only computerised.

However, in the case of numerical statistical data banks, the situation is not the same. Because statistical data are subject to periodic and frequent review, and because often the quick updating of figures is required, the PADIS-STAT component will conceivably be most difficult to develop.The definition of elements to be included, the creation of files themselves, and the very structure of this data base will be highly technical particularly once we reach the stage of attempting to integrate the various national data bases. It will require the design of a system that can enable the researcher upon request, to obtain information on, for example, the quantity of product A of grade 3 produced by country T in 1977 and exported to countries X, Y and Z respectively. That is on the international level. Perhaps on the national level, the planner would be interested in the number of typhoid cases in district number 4, the related mortality statistics, type, acquisition and costs of treatment etc. - all from the same system.

(d) PADIS-NET: A telecommunications network seen mainly as providing access to information outside Africa, as well as interconnecting the system on the continent. By telecommunications interconnection with existing international networks (in particular the data bank centre of the European Space Agency (ESA) and of FAO-AGRIS in Rome), this component will make available to African users the information which cannot be covered by PADIS-DEV and COM, such as scientific and technical information produced by the industrialized world, e.g. AGRIS - as mentioned earlier.

This component requires the importation of technology to enhance our own telecommunications systems in Africa, which, needless to say, are seriously underdeveloped. In many countries the telecommunications lines are poor or non-existent. It will be necessary to instal ground satellite technology to CCO in Addis and ESA in Rome.

2. Zimbabwe's NIDC requirements.

To say that the information processing houses in Zimbabwe are insufficiently backed with computing facilities is a gross understatement of the problem: The sudden upsurge in the demand for computing in both the private sector and the public sector, in the post-sanctions period is ample evidence of the quest for improved and increased information processing. We have a situation whereby even the Central Statistics Office, the major documentation centre in Zimbabwe, finds itself unable to supply information promptly to planners, administrators and policy-makers, no less to financiers, technicians and so on, for no other reason than that this bureau is not fully computerized and data retrieval often entails manual search.

Had we inherited a well functioning and organised socio-economic data base , such Ministries as Lands, Resettlement and Rural Development, Education, Agriculture, Manpower Planning and Economic Planning, to name but a few, should not have been so severely curtailed in their respective missions due to the apparent absence of data. Information is required for planning education programmes, peasant sector credit schemes, resettlement programmes, and rural development projects, among many other fields; a census is planned for the coming year, a manpower survey is ongoing - but for none of these projects are there adequate facilities for processing data analysis.

Surveys may be conducted, but the unavailability of desirable and appropriate means for analysis and the prospect of later having to wade through the original questionnaire for the raw data, have a bearing on the quality and quantity of surveys and micro studies, right from the design stage.

I have outlined these computing and data-processing problems and paid attention to the situation prevailing in government because this issue will have an important bearing on the NIDC in terms of what information, particularly statistical, can be hoped to be collected by the centre, the possible expected delays, and hence how up-to-date the compiled statistics might be.

In the discussion yesterday, the question was raised as to the justification for computerizing the information and documentation centre at this stage - whether this would in fact enhance the efficiency of the services or whether we might be diving at the deep and, blinded by the prospect of developing an apparently more attractive and sophisticated system using advanced technology, possible and perhaps at the expense of efficiency and, as mentioned, employment opportunities.

In my opinion, the computerization of the documentation and information sources, and with particular reference to the NIDC, must of necessity be treated as consisting of two complementary projects:

On the one hand we have the monumental task of collecting, analysing, selecting, cataloguing, indexing and abstracting documents, published and unpublished literature in our libraries, archives, information centres and so forth, and mounting all these onto computer, not excluding the preparation of directories for researchers' use. This exercise alone presupposes that a well-organised programme for the search for documents and subsequent documentation has been set up.

On the other hand, we have the problem of computerizing statistical data, not at the centre, but all numerical data generated within and outside this country. As highlited in the paper delivered this morning by Dr. Mozondo, on the data and information requirements for the fulfilment of government's objectives for this socio-economy, the basic deficiencies in the availability of relevant data for planning arise from the specification of requirements, methodology and aggregation of variables. Not only is our data collection biaised against collection of information on particularly the impoverished classes of our society, but there has been no systematized and integrated compilation of what data are available. Regarding the computerization of these data the situation is even grimmer: and that is mainly social data. Even when one takes into consideration figures on production, the detail on sectoral inputs is far from adequate, where available. Whatever models be they econometric, input-output or other, the planning ministries were to choose for describing this economy, they would have to be based on sound, detailed, precise and processed data - necessitating the use of the computer. The development of the methods of collecting and storing numerical data in such a way that retrieval and updating do not become tedious and time-consuming, that is the computerization of those responsible institutions within the public sector, is a necessary and urgent prerequisite to the seeting up of the computer system for the NIDC, for this aspect of its functions. I say a prerequisite, because contrary to the view that a dedicated system for the NIDC could not and would not interfere with the development of computerization within government, it is probable that the installation of such a system in advance for the centre would introduce a bias into the selection procedure for the computer systems within the country.

The point I want to make is that, as much as it is expedient that tools for the processing of information are developed urgently, the effectiveness of a computer system for the NIDC is dependent on the effectiveness and efficiency of methods used at primary levels of documentation. To presume that the introduction of computerized methods through the NIDC, will in itself enhance the effectiveness of the whole mechanism of information procurement, documentation and dissemination before the needs at lower levels of the system are met, may be putting the cart before the horse.

The NIDC requires the possibility of inputting processed information from all over the country. It entails establishing links with other national (primary) documentation and information sources with minimum technical constraints. Because the NIDC is not supposed to be a processing centre in itself, its establishment should not unduly influence the development of other supporting systems.

It is my view therefore, that the computerization aspect of the NIDC must concern itself first and foremostly with the quality of data processing at primary levels. There seems no point in creating and developing the system of data entry, installing terminals for interrogation countrywide and so on, to support the NIDC when these are still in infancy at the primary levels.

Not only are our telecommunications lines in need of upgrading and specialization for data to be compiled and transmitted nationally, training requirements are large for both aspects of computerization, though this area will be dealt with in great detail in the session on training needs.

The technology is advanced, and experience has shown that Third World countries persistently lag behind and continue to have to borrow from the industrialized countries for technical advancement. We must therefore be very cautious and have carefully estimated our requirements and appropriateness of systems to them, before embarking an large-scale computerization projects.

I feel that the computer system for the NIDC must either be stalled until such time as the primary systems are adequately improved, or be initially established to be instrumental in transforming and enhancing existing national institutions, for its own sake at a later stage. Else, I fear we may find ourselves with a white elephant of a National Information and Documentation Centre.

6. The Joint ESAMI/PADIS/DSE-Seminar as covered by the Press

The Herald, Tuesday August 4 1981 Page 5

Data key to society's progress, says Shava

HERALD REPORTER

THE Minister of Manpower Planning and Development, Dr Frederick Shava, said yesterday that the gathering of information and data will be of significant help to decision-makers and planners.

Speaking at the opening session of a five-day seminar on the use of information and documentation, in Salisbury, Dr Shava said the process of gathering information and documentation would play a major role in assisting decision-makers and planners to arrive at decisions that would benefit society immensely.

"Developing countries have to rely on information and documentation to pick the most suitable technologies for their people and information in this regard reduces the extent of uncertainty about the effects of plans and decisions they adopt.

"The availability of data enables the planner and decision-maker to know beforehand the range of possible outcomes that these plans are likely to bring about," Dr Shava said.

He said the deliberations of the seminar were very important because they would help the Government in the use of proper information and documentation for policy formulation.

There are 35 participants and 10 lecturers taking part in the seminar sponsored by the German Foundation for International Development, the United Nations Economic Commission for Africa, the Pan-African Documentation Information System, the Eastern and Southern African Management Institute and the Botswana National Institute for Research.

The opening session of the seminar was also attended by the West German Ambassador to Zimbabwe, Dr Richard Ellerkmann.

BEST COPY AVAILABLE

Africa 'must co-operate' on research

Herald Reporter

AFRICA needs to co-ordinate its efforts to create a Pan-African documentation and information centre to plan ahead for development projects, Mr Moton Malianga, the Deputy Minister of Economic Planning and Development said yesterday.

Mr Malianga said such a centre would strengthen national information systems and provide decision-makers with the necessary data to formulate their policies.

He told delegates to the five-day seminar on the use of information and documentation, which opened in Salisbury on Monday, that African countries still relied on foreign researchers almost two decades after independence.

"In the post-colonial era the struggle toward self-reliance and socio-economic development has necessitated great emphasis being placed on the formulation of national development plans aimed at improving the quality of life of the masses, and on their implementation.

MR MALIANGA

"This struggle and emphasis has taken place notwithstanding persistent and articulate manoeuvres of imperialists to strangle and destabilise our economies and enforce our dependence on them.

"It is in our interest in Africa to learn from one another, from those who have been in existence before us, and to consolidate our efforts."

Mr Malianga said he hoped the proposed documentation centre would not be turned into a mere library, but would become a focal point for "institutionalised contact between users and generators of information".

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Rural library on the cards —Culverwell

Herald Reporter

THE Ministry of Education and Culture plans to set up a national library service, extending into the rural areas, and to expand the service to include documentation and information centres.

The Deputy Minister of Education and Culture, Senator Joseph Culverwell, told delegates at the closing session of the five-day seminar on information and documentation in Salisbury yesterday that the plans for an integrated national library service would underpin development plans.

"It is clear to us that if the main thrust of our national development programme is aimed at the rural areas, then our national library service must also serve that sector," he said.

"Planning of library and information services in this way is a relatively new concept and we are, therefore, very fortunate that in Zimbabwe this is taking place at a time when our national development plans are still on the drawing boards."

The plans are a result of recommendations made to the Government by a British consultant and they formed the basis of the ministry's three-year library development programme.

They included establishing a national library headquarters in Salisbury to serve regional libraries in Matabeleland, Midlands, Victoria, Manicaland and Mashonaland, which in turn would be responsible for running mobile library services operating in all the districts.

Senator Culverwell said the establishment of an information and documentation centre, which the seminar discussed, should be considered as part of the national library service project.

"The distinction which others might seek to make between libraries and documentation centres has very little meaning, particularly in a developing country like Zimbabwe. Planners of information and documentation — should not work in isolation from the library service."

It was hoped to create a national library council of representatives of the main user agencies and other bodies.

One of the main functions would be to monitor the service.

Senator Culverwell said the training of future librarians should prepare them to be community leaders. "The librarian we must seek to produce should be more of a shopkeeper, standing ready to serve the needs of the literate as well as the non-literate."

He thanked the West German Foundation for International Development, the Economic Commission for Africa, Botswana and Tanzania for sponsoring the seminar.

JOINT ESAMI/PADIS/DSE-SEMINAR ON

THE USE OF INFORMATION AND DOCUMENTATION FOR

PLANNING AND DECISION-MAKING

Ambassador Hotel, 3 - 7 August 1981
Salisbury/Zimbabwe

Monday 03-08-81

9.00	Registration of participants
9.30	Official opening by Hon. Dr. F. Shava, Minister of Manpower, Planning and Development
10.00	Tea/Coffee break
10.30	Introduction by staff, lecturers, participants Adoptation of programme
12.30	Lunch
2.00	Information and documentation services in Zimbabwe (Mr. B.L.B. Mushonga, Senior Government Librarian)
3.00	Role of information in decision making (Mr. A. Musana, Librarian, ESAMI, Tanzania)
4.00	Tea/Coffee break
4.15	Information processing - coping with the user's needs (Mr. F. Inganji, Botswana National Institute of Research)
5.30	End of evening session

Tuesday 04-08-81

8.00	Data and information requirements for growth with equity in Zimbabwe (Dr. T. Muzondo, Chief Economist, Ministry of Economic Planning and Development)
9.00	The role of libraries, information and documentation centres in national development (Mr. O.T. Mupawaenda, Deputy Librarian, University of Zimbabwe)
10.00	Tea/Coffee break
10.30	The concept of national information system in Zimbabwe (Mr. S.R. Dube, Deputy Govt. Librarian, Government Library Service)
11.30	The use of data for planning and decision making (Dr. G. Mandishona, Director of Central Statistics Office)
12.30	Lunch

2.00	The need of a National Information and Documentation Centre (NIDC) in Zimbabwe (Hon. M. Malianga, Deputy Minister of Economic Planning & Development)
3.00	Tea/Coffee break
3.15	PADIS - introduction to the regional system (Dr. G. Romerio, ECA/PADIS)
4.15	Computer system requirements for the Zimbabwe's PADIS-NIDC proposals (Miss N. Chitepo, Ministry of Economic Planning)
5.00	End of evening session
6.00	Cocktail - German Ambassador

Wednesday 05-08-81

8.00	PADIS - information storage and retrieval techniques (Dr. G. Romerio, ECA/PADIS)
9.00	PADIS - computer system proposal (Dr. G. Romerio, ECA/PADIS)
10.00	Tea/Coffee break
10.30	PADIS - document analysis procedures. Short introduction (Dr. G. Romerio, ECA/PADIS)
10.45	Workshop presentation (Mrs. Trinidad, ECA/PADIS)
12.30	Lunch
2.00	PADIS - examples of document analysis and reference retrieval - Discussion (Dr. G. Romerio, ECA/PADIS)
3.00	Tea/Coffee break
3.30	Continuing ECA/PADIS - document analysis
5.00	End of evening session

Thursday 06-08-81

8.30	PADIS on-line system (Introduction Dr. G. Romerio, ECA/PADIS)
8.45	On-line retrieval procedures, Workshop (Mr. Dejen, ECA/PADIS)
10.00	Tea/Coffee break
10.30	PADIS Workshop - Microfiche/film (Introduction Dr. Romerio and Workshop with Mrs. Trinidad and Mr. Dejen)
12.30	Lunch
2.00	Visit to University of Zimbabwe Library and National Archives, Zimbabwe
5.00	End of session

Friday 07-08-81

8.30 Future developments of PADIS (Dr. J. Quirino, Director, ECA/PADIS)

9.30 Information policy and training needs for Zimbabwe in the framework of the NIDC project
Discussants: Mr. B.L.B. Mushonga, Senior Government Librarian; Dr. G. Romerio, ECA/PADIS; Dr. J. Quirino, ECA/PADIS; Miss. N. Chitepo, Ministry of Economic Planning & Development; Mr. M. Johnson, Librarian, National Free Library; Mr. A. Musana, Librarian, ESAMI/Arusha; Mr. F. Inganji, Botswana National Institute of Research; Dr. T. Moeller, German Foundation for International Development.

10.30 Tea/Cofee break

11.00 Discussion on training needs continues;
Drafting of recommendations on need for Government policy on information and training needs.

12.30 Closing address - Hon. Senator J.C. Culverwell (Deputy Minister for Education and Culture)

JOINT ESAMI/PADIS/OSE-SEMINAR

ON

THE USE OF INFORMATION AND DOCUMENTATION FOR PLANNING AND DECISION MAKING

Ambassador Hotel, Salisbury/Zimbabwe, 3-7 Aug. 1981

LIST OF PARTICIPANTS

1. Mr. E.T. Chengu
   Assistant Secretary
   Ministry of Lands, Resettlement and Rural Development

2. Dr. N.E. Dhlembeu
   Under-Secretary
   Ministry of Trade & Commerce

3. Mr. K.J.M. Dhliwayo
   Agricultural Economist
   Ministry of Agriculture

4. Mr. F.P. Gonese
   Senior Administrative Officer
   Ministry of Mines, Head Office

5. Mr. E.R.K. Gumbo
   Librarian
   Ministry of Manpower, Planning and Development

6. Miss A. Holland
   Librarian
   Ministry of Agriculture, Dept. of Veterinary Research

7. Mr. N. Johnson
   Librarian & Secretary
   National Free Library of Zimbabwe, Bulawayo

8. Mrs. A.S. Kamba
   Director
   National Archives of Zimbabwe

9. Mrs. S. Mabaso-Kwalo
   Librarian
   Ministry of Economic Planning & Development

10. Mr. S.M. Made
    University Librarian
    University of Zimbabwe

11. Mrs. T. Makura
    Librarian
    Ministry of Local Government & Housing, Dept. of Physical Planning

12. Mr. J. Mapondera
    Cultural Officer (Institutions)
    Ministry of Education & Culture

13. Mr. E. Moyo
    Administrative Officer
    Ministry of Local Government & Housing

14. Mrs. B.F. Mtero
    Director for Projects
    Ministry of Community Development & Women's Affairs

15. Mr. G. Mudadada
    Assistant Secretary
    Ministry of Works

16. Mr. T. Mudariki
    Director of Research & Training
    Ministry of Community Development & Women's Affairs

17. Mr. W.F. Mudiwa
    Assistant Secretary
    Ministry of the Public Service

18. Mr. M. Mudzi
    Assistant Secretary
    Ministry of Home Affairs

19. Mr. M. Terera
    Librarian
    Ministry of Industry & Energy Development

20. Mr. J. Tsimba
    Under-Secretary
    Ministry of Information & Tourism

21. Mr. T.K. Tsodzo
    Director of Research & Planning
    Ministry of Youth, Sport & Recreation

22. Miss L.M. Welsh
    Librarian
    Ministry of Agriculture, Central Library

LIST OF LECTURERS AND STAFF

1. Mr. B.L.B. Mushonga
   Senior Government Librarian
   National Archives of Zimbabwe, Salisbury

2. Mr. S.R. Dube
   Deputy Government Librarian
   National Archives of Zimbabwe, Salisbury

3. Mr. A. Musana
   Chief Librarian
   Eastern & Southern African Management Institute, Arusha/Tanzania

4. Mr. F. Inganji
   Documentalist
   National Institute for Research, University of Botswana, Gaborone

5. Dr. J. Quirino-Lahounmey
   Director, PADIS
   Economic Commission for Africa, Addis Ababa/Ethiopia

6. Dr. G. Romerio
   Technical Director, PADIS
   Economic Commission for Africa, Addis Ababa/Ethiopia

7. Mrs. Trinidad Haile
   PADIS-Documentalist
   Economic Commission for Africa, Addis Ababa/Ethiopia

8. Mr. Dejen Abate
   PADIS-Data Base Manager
   Economic Commission for Africa, Addis Ababa/Ethiopia

9. Dr. T.R. Muzondo
   Chief Economist
   Ministry of Economic Planning and Development, Salisbury/Zimbabwe

10. Dr. G. Mandishona
    Director
    National Statistics Department, Salisbury/Zimbabwe

11. Miss N. Chitepo
    Research Economist
    Ministry of Economic Planning & Development, Salisbury/Zimbabwe

12. Mr. O.T. Mupawaenda
    Deputy Librarian
    University of Zimbabwe, Salisbury

13. Dr. T. Moeller
    Information Consultant
    German Foundation for International Development, Bonn/FRG